Elec (Jan)

Some Anatomists say that there are three some for others five Coats to the arteries, 1st. the membranous, 2d. the Cellular, 3. the Nervous or elastic, 4. the Muscular & 5th the cuticular. But properly speaking, they have no distinct Coats at all, unless about an Inch or little more of the Aorta & Pulmonary; which are surrounded for that distance, by the Membranous Sac called the Pericardium; but this membranous Covering lies loose & is independent of the arteries and cannot be said with any propriety to belong to the arteries — What Authors mean by the diff.t Coats of y.e arteries are only the many differ.t Directions of the Fibres of y.e Arteries; but these are so closely connected together, that they cannot be seperated without great Violence. However it may not be amiss to explain what they meant, more fully: Those who say there are five Coats, call y.e first or external plan of Fibres which run in many differ.t Directions, y.e Membranous Coat; the next plan which are more Circular they call the Cellular; the 3.d running spirally, the Nervous or elastic; the 4th taking quite a Circular Course is the Muscular; and the 5th or internal Coat, from its Fineness & smooth Appearance, is called the Cuticular — But whoever will take a Piece of the Aorta or any large artery & make the Experim.t, will find, by making an Incision transversely thro its Substance, it appears quite hard, firm & Compact; so that these Fibres cannot be distinctly seen or demonstrated: whereas take a piece of Intestine & divide it transversely & you will find, plainly three Distinct & seperate Coats with a Body of Cellular membrane between each of them; hence the Intestines may fairly be said to have 3 Coats. — The Internal Coat so called, is the smoothest of any in y.e Body, especially transparency of y.e Eye; and this seems to be contrived by Nature for the more easy & free

Coat, serves to give it strength, the next the muscular will give it action, and the 3d the Cuticular is finely Polished for the easier Circulation of the Blood —

It is customary for Anatomists to to say that those Parts which have a power of Contracting, are composed of muscular Fibres and they speak of them [illegible] Similar to the muscular Fibres of the muscles themselves; but there is a very material Difference in the appearance of what they call the muscular Coat of the arteries, and the muscles of the Body; the one is red & inelastic, the other, white & Elastic. It is the opinion of the best Anatomists now, that the arteries have no muscular Fibres at all —

The arteries have no Valves, as the Veins have, unless it is immediately at their origin from the Heart; but we can't say whether they belong to the Heart or Arteries —

N.B. Mr. Fox thinks there may be a Transudation of Blood after Death from their Vessels, but it proceeds chiefly from the Veins: he does not believe it does happen during the Life of a Person —

The arteries are supposed by some to be dilated in their diameter and hence the Stroke we feel when touching the Pulse, thus the Man that has no dilatation at all — whether Elastic or Inelastic the arteries have are always filled with Blood —

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Before the art of making Preparations and the use of Injections was understood, it was the general opinion of anatomists that the arteries were nourished by the Blood in its Passage thro them; but anatomists of ye present age are of a different opinion, for they consider the arteries only as conductory Canals for the Blood, and notwithstanding their white appearance, it can be demonstrably proved by Injections that they are Vascular, tho their Vessels are so very minute as to escape the naked Eye, and they are called the Vasa Vasorum and have Veins to return their Blood as all other Vessels have; but the Veins are so fine that they cannot be injected, but by a lucky Injection the [illegible] the arteries; from analogy however it is beyond a doubt [illegible]

The diff^t. Direction of the Course of the Fibres of arteries, ~~are~~ supposed to strengthen them and to prevent their being ruptured by accidental Causes, as Blows &c. it is very probable they may serve this purpose and by this means they can bear resistance & act with greater Force against the circulating Fluid, to propel it forwards. ——

Physiologists tell us, that the Circulation of the Blood is quicker in the Capillaries than in the larger Vessels and the observation we make in Amputation of the Fingers or Toes seems to confirm this opinion; for, it is remarked, that the Blood runs from the Small arteries here, in a continued Stream on the contrary when a large artery is divided, the Blood flows from it per Saltus, tho it must be confessed with much greater Force. ——

When the arteries become very minute, they lose the pulsific Quality and then they no longer retain the name of Arteries, but are called Veins; but where this change is o[illegible]

☞ He is lead to think so from seeing a Tumour once dissected from the Throat, in which the Carotid was wounded, and tho the Patient lost a great deal of Blood, which was thrown out with great violence; yet he recovered.

no Person can precisely determine —

An Anastomosis is a Communication of one artery with another, as the Coronary in the Stomach, ye. Basilary in the Head, the Radial & Ulnar in the Palm of the Hand and many others These anastomoses are of very great use & advantage in aneurisms and after amputations: this is so obvious as to need no Explanation. There have been Instances of the Crural & Brachial Arteries having been divided and the Limbs have afterwards been preserved by the Circulation's being carried on by means of these anastomoses* — Mr. Else thinks that a division of ye. carotid artery will not always prove mortal

*. an Instance of ye. Crural artery being divided without producing immediate Death by the Hæmorrhage, lately occurred in St. Tho's. Hosp.l. The artery was totally divided near the middle of the Thigh and immediate assistance being procured and a Ligature made upon the Vessel, the Hæmorrhage stopped, and the man lived several weeks, when he died of a putrid Fever after the Wound was almost Cicatrized: his Limb remained swelled & Oedematous for some time, owing to the weak Circulation, but it was greatly subsided before his Death — Here it is evident the Circulation was carried on by the anastomosing Branches which undoubtedly became more & more distended as the Circulation increased —

Mr. Else shewed us a remarkable Instance of this in a preparation of ye. Thigh of a Man, who had an ~~[illegible]~~ Obstruction of ye. Crural artery near the Groin, and the Circulation was carried on by the anastomosing Branches, which in time became ~~[illegible]~~ nearly as large as the Crural artery itself which was entirely obstructed & wasted away for some distance. ~~[illegible]~~ —

This Case made a great noise at the Time; it was called the Roaring aneurism, and was thus — a Man was brought into St. Thomas's Hospital with a Tumour on the inside of ye. Thigh which had an evident Pulsation

Pulsatory motion, on which account it was supposed to be an aneurism: The Tumour disappeared, and the man went out of the Hosp.l well; but came again some time afterwards with a large Swelling under the Arm-Pit which extended backwards under the Scapula. Between the time of his going from the Hosp.l & his coming again, it was said that a Tumour like the first appeared in the Harm of y.e same Limb, but likewise went away: However this might be, the man, some time after he was taken in the second time, died, being entirely worn out with excessive Pain, occasioned by the Tumour's pressing upon a large Plexus of Nerves lying in the arm Pit. Upon Dissection, the Tumour in the Axilla, as was expected, was found to be from an aneurism of y.e Axillary Artery: but what was the Cause of y.e Tumour in the Thigh, that it should first appear with a Pulsatory motion & continuing for some time, at last should entirely disappear? To discover it, the Crural artery was Injected at the Groin, as was likewise the Vein. Upon Dissection, a Tumour was found situated immediately upon the Artery so as to compress the it in such a manner as entirely to obstruct the circulation by totally obliterating the Passage for the whole length of y.e Tumour; and the Injection of the artery had passed thro an anastomosing Branch which was sent off just above the Tumour & communicated again a little below it.

The Tumour we suppose to be originally an Indurated Lymphatic Gland. ——

They terminate with open Mouths likewise on the Surface of the Skin from whence proceeds the Transpiration; and the Fluid which is found in the different Cavities in the Body are deposited there by these Lymphatics or arteries and may be considered as internal Transpiration —

Anatomists mention 3 Species or Orders of Arteries, first, the Sanguiferous, which carry red Blood and are the largest of any; Secondly, the Serous, which are smaller & carry Serum or the Thinner Parts of ye. Blood, but the red Globules cannot enter them; and the Third, the Lymphatics; these take up only the thinnest & finest Parts of ye. Blood, and are very fine Pellucid Tubes arising from every Part of ye. Body, and will not permit any of the Globules or Serous Part of ye. Blood to enter them.*

The Arteries not only terminate in Veins, but in diffr. manners as we find, in the Pancreas & all the Glands, ye. minute Ramifications of ye. Artery terminate, some in the Veins which bring back the Blood, others in small excretory Ducts, which joining all together, form one Canal, which is called the excretory Duct of ye. Gland, thro wch. the Secreted Fluid Passes. In this manner the Urine is secreted in the Kidneys, ye. Bile in ye. Liver &c. but this will be better understood, when we come to describe the Glands, their Secretion &c. when we shall likewise give a Description of the diffr. opinions for & against the existence of Follicles in Glands.

Arteries sometimes of the Extremities of old People are found ossified: this is said by some to be owing to pressure, but it is not true; as young People are sometimes affected in the same manner, tho rarely: others attribute it to a disposition in the Habit to ossification by a redundance of the earthy or chalky Bony matter, and which is lodged between the internal & middle Coats of ye. Arteries: however this is, it is evident, that if ye. ossification is so great as to put an entire Stop to ye. Circulation in those Parts, a Gangrene will follow as high up as the Obstruction reaches ——

*. Lymphatics are generally believed, tho some deny it, to terminate

with open Mouths in membranes lining Cavities, hence ~~the~~ proceeds the Watery Fluids found in the Cavities of the Body, & not from Transudation; and in every Cavity, there are absorbent Vessels to take up the Fluid emptyed into it by the Lymphatics —

†. If we suppose Pressure to be the Cause of the ossification we should find hard labouring People scarcely ever free from them; besides, ossifications are found in the large arteries as well as in the small arteries of the Extremities — It seems as if the ossific Matter was brought by the Vasa Vasorum, and being lodged between the Coats of the artery accumulates gradually — May not these ossifications ~~to~~ frequently cause aneurisms? — Mr. Cæsar Hawkins says he never saw an aneurism, but he allways found upon examination, a considerable Stricture in the Vessel below it — There is in all probability a Disposition in the Habit to form these Ossifications, and Gouty People whose Blood abounds with a Cretaceous matter are more subject to them than others —

Lecture 3d. Octr. 3d. 1770 —

On Aneurisms.

In our last Lecture we just mentioned one Disease of the arteries, Ossifications; we shall now proceed to speak of other Diseases, and first of the Aneurism.

Aneurisms are of two Species, the true & false. The True aneurism is a preternatural distension or Dilatation of an artery; the false is, when ~~there is a Wound made~~ in the Artery either by the bursting of ye true aneurism, or by a Lancet in Bleeding, ~~[illegible]~~, or any sharp Instrumt. wounding it.

It has been said by Le Dran and others, that the artery as it becomes distended, grows thicker in proportion. Now it is reasonable to suppose the contrary would happen, which is indeed the Case; for upon a strict examination of ye. Vessels they will be allways found thinner in proportion to the Dilatation; but when an aneurism has been of long standing, ye Blood adhering to the Sides of ye. Artery, becomes coagulated and gradually grows harder & thicker, & at the same time the Fluid Blood passes thro the middle of the Vessel: this Coagulum ~~gr~~ daily increases and growing thicker, the aneurism becomes harder to the Feel, and loses its Pulsation; which is the true characteristic of an aneurism and which perhaps was very evident in the incipient State of ye. aneurism; it is this hard concreted Coagulum firmly adhering to the Sides of ye. Vessel, which led Le Dran and those who adopted this opinion, into the Error of supposing the artery to thicken as it became dilated. This Coagulum may be ~~easily~~ seperated from the artery, and it accounts for the Reason why a Puncture made into such an aneurism is not followed by a profuse Hæmorrhage: besides, if this was not the Case, the true aneurism would never burst,

or become the false or Spurious, which we know to be frequently the case. There is often a Disposition in the Habit to produce Aneurisms; and I believe many People, who die without their Disorder being rightly understood, have died in consequence of an aneurism in some part of the Body, where the Tumour cannot be perceived: we often find these People subject to fainting Fits; which was the Case of a woman who was in St. Thomas's Hosp.: She was subject to frequent fainting Fits, which was said to be Hysterical, and she likewise complained of a Pain in the Loins about the Region of y. Kidneys. The med.es prescribed for her, did not alleviate her Complaints, tho' she was a little relieved in the Pain in her Loins by Bleeding; she died after some time, and it was desired she should be opened; when, a large Tumour was discovered near the left Kidney, which upon examination was found to be an aneurism of the aorta which after being much distended had burst, and an Extravasation of fluid Blood had been thrown out from time to time, as was supposed, which might probably be the reason of her frequent Faintings — Another Instance was of a man who was brought into the Hosp.l as a Subject for Mr. Else to demonstrate the Viscera upon; in opening the Thorax of whom, a Tumour was discovered lying on the Vertebra, which proved to be an aneurism of the aorta, which had been of so long standing, as to occasion a Caries of y. Vertebra. — What is most remarkable in these aneurisms, is, that the Patients should live for such a length of time as they do, after the Bursting of the aneurism which is situated so near the Heart in such large Vessels — This is owing to the pressure which the Viscera of these Cavities exerts against the Tumour —

Authors say that a Spurious aneurism (unless made by an external Cause) cannot happen without a previous Dilatation of the artery; that is, that an artery cannot be ruptured without a previous Dilatation: but that this is wrong is evident from a Case which happened in this Hospital; where the aorta was found to be ruptured in two Places, just where the Carotids are sent off, without being in the least dilated: The preparation of this Mr. Else shewed us —

We now proceed to Speak of y^e. Veins —

These are elastic Tubes arising from the extremities of the Arteries and terminating in the Auricles of y^e. Heart, the 2 Cavas in the right, & the Pulmonary Veins, in the left auricle; serving by this means to bring back the Blood from all parts of y^e. Body, carried there by the arteries, to the Heart —

Authors disagree much about the Structure of y^e. Veins; some say they have the same Coats with the arteries, but are so thin that they cannot be seperated. Others say that there is no muscular Coat to them; whilst Haller says that muscular Fibres may be found in the large veins near the Heart; Calfin is of opinion that there is none, and I am inclined to be of the same opinion —

The Veins generally take the same Course with the Arteries & accompany each other, at least all the larger Branches, as we see in the Cava & aorta &c., but the Coronary Veins do not take the same Course as the arteries, & the Cutaneous Veins have no arteries to attend them —

As the arteries have Vasa Vasorum for their nourishment, we may likewise with equal propriety say that the Veins have — They anastomose likewise in the same manner as the arteries do.

The Circulation is said to be slower in the Veins than arteries; but Haller has proved by Experiments upon Brutes, that it is not so.

It was formerly the opinion, and indeed is now with some, that the Mesenteric Veins had a power of absorption; but it is beyond a Doubt that they only serve to carry back the Blood from the arteries, as other Veins do: there is nevertheless a power of absorption in some of y^e. Sanguiferous Veins, as those of the Penis & Clitoris —

The Veins have fine, thin Membranes, of a Semilunar Form, on their internal Surface, which are so situated, as to suffer the Blood to pass freely onwards the Heart, but will prevent the Blood's Regurgitating or returning back — These are called the Valves, and are said to be formed by the continuations of the fine Cuticular Coat of the arteries. They are placed obliquely in such a manner as that

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that the Column of Blood, in passing towards the Heart, shall press them against the Sides of ye Veins; but as soon as it attempts to return Back, they rise up and, as there are frequently two of them situated opposite each other, the Edges of them are brought together & form an entire Stoppage to the Blood's passing back; by which means it is forced on continually in the right Course.

The large Veins are said to have no Valves, as those in the Cavities of the abdomen, & Thorax — The Valves are most numerous in those Places where the Blood has to move upwards against its own Gravity; as in the Spermatics, & Veins of the Extremities, the Converse especially —

Tho the Veins are elastic, yet they have no Systole & Diastole, as the arteries have; but the Blood is propelled onwards to the Heart, by the Pulsation of the arteries (in those Veins wch lie contiguous therewith) and by the action of the Muscles; hence the reason why the Circulation is encreased by exercise & strong muscular motion —

Lately it has been asserted that the Large Veins near the Heart have a Pulsatory motion like the arteries, ~~and that this Motion in them was caused by their having a pulsatory power in themselves, similar to that of the arteries~~; but this is wrong, and tho' the large Veins near the Heart are observed to have a Dilatation & Contraction, yet it is not that all the Veins in the Body or even these have a Pulsatory Motion similar to that of ye arteries, but is caused by a Regurgitation of Blood into them; This Regurgitation, which obeys the Motion of Respiration, is

brought

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brought about in this Manner — The Pulmonary Artery receives Blood from the right Ventricle, this from the right Auricle into which the Cavas empty themselves; now, in Expiration the Lungs are ~~collapsed~~ distended, at which time we may imagine that the Blood has not so ready and easy a Passage into the Capillary Branches of ye Pulmonary Arteries, hence a quantity of Blood will be detained, or thrown back from the arteries, into the Ventricle, which by this means becomes distended ~~and not the Heart contracting the Diaphragm acting~~ and the Blood being emptied into the Auricle and not finding at this Time a Passage into the Ventricle is thrown back into the Veins which have no Valves to prevent it, and meeting with the other Column of Blood coming towards the Heart creates a Dilatation or Distension of ye Veins, as the Carotids, Subclavians Vena Azygos &c: but immediately as soon as Expiration is performed the ~~Obstruction~~ in the Capillary Branches of ye Pulmonary arteries is removed by the Lungs becoming ~~decreased~~ collapsed, the Ventricle Contracts and empties itself as does likewise the Auricle from whence the Blood is thrown into the Ventricle & the Veins ~~from being~~ before distended by the Regurgitation now contract to their Natural Size; hence these Veins appear to have a Pulsation — This Regurgitation ~~is~~ likewise caused by the Contraction of the Ventricle — The motion of the Brain is occasioned by

this

this Regurgitation of the Blood into the Sinuses, which occasions an obstruction & distention in the Veins of the Pia Mater ~~Same~~

*. This Tumour was of a considerable Size & had been of long standing when he came into the Hospital; it was situated near the Elbow above the Joint and had no Pulsatory motion: but as aneurisms have no pulsatory motion when of long standing & very large, no favourable conclusion could be drawn from that circumstance, and it was thought adviseable to amputate the arm, upon a presumption of its being an aneurism: what served to confirm them in the opinion of its being so, was that the man said it had been punctured with a lancet before he came into the House and nothing was discharged but a serous, bloody Fluid. After the amputation, Mr. Else dissected the Tumour & found it to be occasioned by a large Vein being ruptured, and the Blood coagulating as it was extravasated, formed itself a Bag, which kept continually thickening as the Blood concreted to its Sides, as in the aneurism, till it was several Inches thick, and in the middle of ye. Tumour was found a small quantity of fluid Blood, so that the Tumour increased in proportion to the Extravasation.

Of the Diseases of y^e. Veins.

When we see a Vein preternaturally distended & knotty, as is frequently the Case in the Superficial Veins of the Legs of those Persons who are Subject to the Cramp, we say that it is Varicose. But a Varix is as liable to happen in the deep seated Veins as in the Superficial, and there forming a Tumour which, being seated ~~either~~ contiguous to an artery, may have a Pulsatory motion and on that account be taken for an Aneurism; or if ~~they~~ it has no Pulsatory motion at all, may be supposed from its appearance & Situation, to be an aneurism. Tumours ~~of~~ from this Cause have frequently been mistaken for aneurisms; Several Instances of which, I have had an opportunity of examining, where the Patients have either died, or Amputation had been performed which I believe is too hastily done in many of these Cases: one Instance of this, was in a man with a Tumour on the arm, anoy^r. in a woman with a Tumour in the Leg, and anoy^r. was in a man who had Tumour ~~in~~ the Thigh; all of which proved to be Veins ruptured. The last of these indeed, was not supposed to be an aneurism at first, but a common abcess; but upon being opened a large Hemorrhage ensued, ~~which~~ upon which amputation was thought to be necessary, as it was then thought to be an aneurism: upon Dissection of the Limb however, the Tumour was found to proceed from a rupture of a large Vein — In all these Cases, there would have been no necessity for amputation, if the nature of them had been known; but the misfortune is, that we know of no distinguishing characteristic whereby we may know the one from the other; for they both put on the same appearance, seldom either of them producing any Discolouration on the Integuments; and an aneurism often has no Pulsatory motion but in it's Infancy (occasioned by the coagulated Blood, as we before observed, adhering to the Sides of y^e. artery); so that it is impossible from these Circumstances to give his opinion positively upon them. The best way to distinguish them & what is most depended on, is the Pulsation, which, in incipient Aneurisms will be very evident.

We have great Reason, if there were no Facts to prove it, to suspect that the Veins are oftener the Cause of these Tumours, than the Arteries

from the Thinness of their Coats and their having Valves which may
Cause obstructions & in Time may Burst & form Tumours —

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Lecture 4th.

On the Nerves —

The Nerves are allowed by all Anatomists to be the principal organs of Sense & motion, tho' at the same time they allow that the real Structure of them is not known. By a Nerve, we mean a white, shining, inelastic Cord, first arising from the medullary Substance of the Brain, and composed of many fine Fibrillo which at their first Egress from the Cranium seem loosely connected together, but afterwards become more firmly & closely compacted so as to form a white Cord.

The Nerves are generally divided into two Classes, those of the Encephalon, and those of the medulla Spinalis; of the first, there are reckoned 10 pair, of the last, 30 pair; and these last are subdivided and take their names from the parts to which they are sent, as, the Cervicales, Lumbricales, &c; the Ten pair which go out at the different Foramina of ye. Cranium, are sent principally to the Head, Face, Eyes, Ears, mouth, and some Twigs of ye. 8th. Pair, go to the Stomach and diffr. parts of ye. Thorax & neck &c. and the 30 Pair which proceed from the medulla Spinalis are bestowed upon all Parts of the Body besides.

The Nerves generally take the same Courses as the arteries, are surrounded by a Body of Cellular Membrane in their Passage to all parts of ye. Body and run between the Interstices of the Muscles, which defends them from any rude Pressure, externally; they differ in their Figure some pulling on a red appearance ~~[illegible]~~, whence some conjecture that they are diffr. in Structure: some we find are round, whilst others are flat, and some appear more fibrillous than others.

Authors differ in their opinions about the Structure of the Nerves; some allow only two Coats, others say they have three: those who are of the last opinion, say, that the Brain has three Coats, the Dura & Pia mater and the Tunica Arachnoides: it is how=

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however much doubted by some, whether the last Coat exists in all Subjects; all anatomists are agreed in this, that it is but a partial Coat at most, not investing the whole Brain, as the Dura and Pia mater do, but is to be found in a particular part near the Basis of the Brain; hence it is probable that the Nerves have only two Sinuses: the external is a continuation of the Dura mater, and the internal, a continuation of ye. Pia mater surrounding & closely embracing this medullary fibrous Substance of the Brain. These continuations of the Dura & Pia Mater are called their Processes. These Coats give the Nerves a proper degree of strength, otherwise the Nervous Fibrilla would not be able to resist such Force as ye. Nerves are sometimes exposed to, and they also support the Vessels which are sent to them. Some Nerves are said to have no Coats or Covering from the Dura & Pia mater, as the 7th. Pair; the Portio Dura of which being covered by the Dura mater forms the Cav Anserina, and the Portio mollis (from which we derive the faculty of hearing) is distributed about different parts of ye. Concha without any Coats at all.

The Nerves appear to the naked Eye to be composed of many Fibrilla connected together by Cellular membrane, which is very apparent in the Cauda Equina, where these small tender Fibres are very minute, as appears by maceration; when the Cellular membrane is loosened from them, then these Fibrilla are seperated & set afloat, from each other, as may be seen in Water. an Expansion of the Fibrilla composing the optic nerve called the Retina appears very fine & beautifull in Water —— But take one of these small Fibrilla, even the smallest you can get, & it will appear by a Microscope to be still composed of more & smaller Fibrilla, so that it is impossible to discover what an ultimate nervous Fibre is; Monroe says, that from an Examination of ye. minimum visible it is demonstrated, that each Fibre of the Retina or expanded optic nerve, ~~and not more~~ cannot exceed the size of the 32400th. part of a hair; and when we consider that every, even the most minute part of ye. Body is sensible, and owes that sense to the Nerves, which if all were

*. We are not to suppose a Ganglion to be a Disease of the Nerves, as they are natural Appearances & are allwaies to be found in the same Places: and when Authors speak of Ganglions, we are to suppose they mean Tumors of the Tendons.

†. Here we are speaking of ye first Class: the most specious Argument in favour of the Opinion of Decussation of Nerves, is, that a Blow shall be given on one Side of the Head & the Limbs of the opposite Side shall become Paralytic, whilst the other Side shall remain unaffected: but those, who have had an opportunity of making the Observation, have observed, that altho' the Circumstance above mentioned does sometimes happen, yet it oftener turns out otherwise, i.e. That the Side of the Body on which the Blow was given shall be affected, whilst the other shall not.

were joined together would not make a Cord of an Inch Diameter, is not to be wondered at.

The Nerves, particularly those of ye. medulla Spinalis, unite in some places & form Knots, which are much larger than all the Nerves which composed them as they pass out the medulla Spinalis Laterally. This appearance is natural to the Nerves only, and is called a Ganglion*. These Ganglions appear more red than the Nerves in other parts do, but the Nerves going from these, are no ways different from the other Nerves, tho the Coats of the Ganglions are thicker; which some will say is owing to their having a muscular Coat, this however cannot be proved. The red appearance in Ganglions of the Human Nerves is seldom observed unless they are diseased, but it is allways visible in Brutes, as, Horses & other large Animals. The use of these Ganglions is variously described by Diffr. Authors; however, it is not known: hence there is room for a variety of Conjectures by Speculative men, and till we arrive at a greater knowledge of the Nerves, ~~their use~~ this will not be understood; some will tell us, that they are formed by Pressure; but the Nerves which have these Ganglions are most of them so situated as not to be liable to ~~the same~~ but very little Pressure, if any; and on the Contrary, those Nerves which are most liable to pressure, as the Cutaneous, are without these appearances. It is evident they were designed for some particular purpose by nature, which we at present are unacquainted with ——

The common opinion concerning the Rise of the Nerves, is that they are sent off from that side of ye. Encephalon* which is nearest to the part of the Skull which they pass out at; tho there are some who contradict this, and say that the Nerves or the pulpy fibrillous Substance before it is sent out of the Cranium decussate or cross over from the side where they are formed, to the opposite side, so that those Nerves which are sent to the right side, are originally derived from the left side of ye. Encephalon. Cheoden mentions a Case which

*. This Doctrine may, tho'a very specious one, be overturned at once, by considering the Origin & Distribution of the 5th Pair of Nerves, which we know, from Dissections & examination, is derived from the Cerebellum, but is distributed to many Parts which have a voluntary Motion.

which seems to countenance this last opinion, and Monroe two similar Cases, where the Palsy and other Symptoms of an Injured Brain appeared on ye Side opposite to where the Injury was received: but he confesses that other Instances may be produced to overthrow this opinion and confirm the other: It remains at present, a dispute among Anatomists: however it is generally allowed by all, that not only ye Nerves of the first Class, as those of ye Sight, Smell, Taste, Hearing &c. but also those of the Medulla Spinalis terminate in a pulpy State, and this is evident that they are expanded on every part of the Cutis which gives it its Exquisite Sensation with which it is endued; and the Nerves may be traced till they lose their Coats & terminate in this Pulpy State —

Some are of Opinion that there are two sorts of Nerves, one derived from the Cerebrum & the other from the Cerebellum: those which come from the Cerebrum, they say, are the Cause of ~~the~~ Voluntary Motion; and those from the Cerebellum, are the Cause of Involuntary Motion, as, that of ye Heart, Diaphragm, abdominal Muscles &c. the 2 last of which are endued with both kinds of motion, partly voluntary & partly involuntary, which last is caused by the action of ye Lungs in Expiration & Inspiration: what induces them to be of this opinion, is because Wounds of ye Cerebrum are not mortal, but have been cured sometimes even when a part of the Cerebrum has come away; but those of the Cerebellum always do prove mortal & frequently produce instantaneous death: This can however, be no proof at all of their opinion, if we consider, that the same Nerve sends out Branches which are distributed upon Parts that are endued with voluntary motions and also upon Parts which are endued with involuntary Motion *. It is proved beyond all doubt, that the Nerves are the organs of Sensation & motion; for, if the Nerves are compressed or become obstructed by any means, or are divided, the Limb, to which these

Nerves

*. a Compression or obstruction of ye. Nervous Influx is sometimes caused by Tumours situated upon the Nerve; and when this is the Case the Limb below the Tumour will become paralytic in the same manner as when the Nerves are interrupted by external Injury, and if the Obstruction is total, the Parts to which the Nerves so obstructed, were sent to, will Gangrene.

Nerves were sent, will lose its motion & sense of feeling, and become paralytic*: of this we are often sensible in some measure, by from the Pressure of the Cubital Nerve by leaning long upon it, when a disagreeable Sensation is felt in the arm ~~and~~ below the Elbow for some time after the Pressure is removed; the same sometimes happens in the Foot, when we say it is asleep; but here motion is not entirely lost, as other Nerves are sent to the Limb besides this: but in such paralytic Cases as are attended with loss of all sense & motion, with wasting of ye Limb, then all the Nerves sent to that Limb are obstructed — hence an Injury done to any part of the Medulla Spinalis immediately affects all the parts whose Nerves take their origin below where the Injury was received; so that if the Medulla was much injured at the Lumbal Vertebra, the lower Extremities would become paralytic; if in the first Vertebra of the Neck, just where it commences ye Spinal Marrow, and the Injury was great, immediate Death would ensue; and tho we cannot account ~~for~~ satisfactorily for all the Phenomena which turn out from Injuries done to the Nerves in other Creatures living nearly ~~as we do~~ under the same Circumstances as we do, yet we know such Causes produce such Effects generally in them as in us — Tho' we can't account for Tortoises their living a considerable time after their Heads are cut off, or a Frog's jumping about after the Heart & contents of ye abdomen are taken out, or why a Worm crawls about after being cut ~~in~~ into several Pieces; I say, tho we cannot account for all these Causes, yet we must not consider them as objections to the Nerves' being the principal Organs of Sensation & Motion, for it is clear that they are; but in what manner this Influence is communicated, or in what way ye Nerves act in producing these Effects Authors are not agreed about. Some affirming that the Nervous Fibres are all solid Cords which act

*. A Fiddle String or any Cord will not vibrate unless put upon the Stretch & kept so; now, can one say, that the Nerves are in that Situation? Besides, we know that when a Cord is tense, it will not vibrate if any thing is in Contact with it; but these Nerves are surrounded & lie closely in Contact with other parts of ye Body: therefore it is very improbable that the Nerves shou^d act in this manner. It seems to be the most probable that they contain a Fluid, which upon being touched, causes an Undulation which is immediately communicated to the Brain: but even this is mere Conjecture & supposition, and those Experim^ts which have been made to prove that a Fluid does Circulate thro them, are not to be depended on; one of which & indeed the principal one, is, that if you cut open the Thorax of a living Dog and catch hold of the Phrenic Nerve & compress it, the Diaphragm ceases immediately to act; remove your Hand, and that muscle will again act; grope the Nerve with one Hand some distance above the Diaphragm, it is unactive; then with the other Hand, strip down the Nerve from the first Hand to the Diaphragm, this muscle again contracts; after repeating this once or twice, it is said, the Liquor will be exhausted and you will not be able by this means to create action in the Diaphragm. Now, what are we to say, when we are told, that whilst with one Hand we compress the Nerve, if we, instead of stripping the Nerve towards the Diaphragm, carry one hand quite the contrary way; i.e. strip the Nerve from the Diaphragm towards the first Hand, and by this means produce the same appearances & Effects? This would seem to shew that the action given to the Diaphragm in the above Experiment, was owing to Irritation — ~~In that case~~ &

†. That the Brain is the common Sensorium, may be easily conceived by the following Case. A man was trepanned & a large portion of the Os Frontis removed; after the man got well, if a pressure was made on the Cicatrix for a little while, ~~the~~ a partial Blindness would ensue; continue the Pressure a little longer, total Blindness would be the Consequence & the man would fall fast asleep with a Snoring kind of noise —

†. These vessels have a beautiful Spiral Course, as may be seen in the Spinal Marrow when injected —

by elasticity or Vibration, in the same manner as a Fiddle String*. whilst others allidge that those Fibres are small Pipes conveying a Liquor by which all their effects are produced. However this may be, we know that the Brain is the primary seat of all Sense, and that the Nerves are the conveying Instrum^ts of that Sense to the common Sensorium, the Brain*. These nerves we know likewise are acted upon by impulse, as by the Touch, Sight &c. and all objects of Sense when applied to their proper Organs act by Impulse; thus, if we are in the dark, we know by the Feel or Touch what it is we do feel, whether Wood, Iron &c. This is caused by the Impulse made upon the nerves & by them carried to the Brain; and the stronger the Blow or Touch is, the greater will be the impulse given to the nerves which will communicate it to the Brain:— hence we may account for the Pain proceeding from a Violent Blow, which sometimes tho given at a Distance from the Head, has been known to bring on the same violent Symptoms as a Concussion of ye Brain caused by a Blow given immediately upon the Head.

The Nervous Fibrillæ are, as we have already observed, connected together by Cellular membrane and covered externally by the Dura mater & internally, that is under the Dura mater it has a second Covering the Pia mater; and tho they appear white to the naked Eye, yet they have a number of Vessels both arteries & veins sent to them, and after a lucky Injection of the arteries, the whole fold will appear coloured by the injected Fluid*, and if the Injection is pushed forcibly into them, ye Cellular membrane connecting the Fibrillæ will appear distended by it; and it is owing perhaps to the Vessels that enter the centre of ye optic nerve & the want of medullary Fibres here, where the optic nerve enters the Eye that we cannot see the Parts of such Bodies whose Picture

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whose Picture falls upon this Central part of the Retina.

The Brain is supposed to be a Gland, y^e. external Parts of which are of an ashy Colour and is thought to be the principal Seat of Secretion which is carried to the internal white, pulpy mass called the medullary part, which is supposed to be a Compages of Fibres, from which arise y^e. Nerves which are considered as the excretory Ducts or Tubes to carry this Secreted Fluid called Animal Spirits to all parts of y^e. Body: but it still remains to be discovered, in what manner the Sense is communicated to y^e. common Sensorium. ~~and how the Animal Spirits, or Fluid~~: Anatomists have taken great Pains to come at the Knowledge of this, but hitherto, their attempts have proved unsuccessful, some asserting that there is Fluid, which they call the Animal Spt^s., contained in the nerves, whilst others insist upon it that the Nerves act by Vibration upon being touched, as a musical string. But this last seems to be improbable, if we consider how the Nerves terminate, in a Pulpy State which renders them very unfit for Vibration: and as they appear inelastic, it is most probable that they are [illegible]le Pipes conveying the animal Spirits to the diff^t. Parts of y^e. Body, tho they are so minute as to escape the most diligent enquiries & searches hitherto made to discover them ——

*. Some likewise dispute its existence in the Brain as well as Bones; but from analogy, we may suppose that it does in Both: for, every Artery & Vessel in every other part of the Body, we know, is surrounded by it; why then, therefore, is it not reasonable to imagine that the Arteries & other Vessels belonging to the Brain & the Bones are likewise surrounded by it, tho' it cannot be proved, on account of ye Hardness of Bones & the soft Texture of the Brain? Haller says, that he has seen the Vitreous Humour of the Eye distended with air in an Emphysema, which seems to prove its Existence there.

†. NB. The Reticular membrane is very apparent in the Penis & between the Coats of ye Intestines: and wherever the Skin lies loose and is at times put into wrinkles or Folds, as in the Eye-lids, on the Cranium, Back of ye Hand &c we know that it is reticular in those Places. on the contrary, where the Skin is smooth & firm we know that it is the Adipose kind which lies under it —

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Lecture 5th.

On ye. cellular Membrane

The cellular Membrane is the universal connecting membrane, which lies immediately under the Cutis and dips down between & fills up all the Interstices of the Muscles; it fills up ye. very Vacuity not only between the muscles, but insinuates itself also between the fleshy Fibres of ye. Muscles & connects them together; it envelopes all the Nerves, arteries, Veins, Tendons, Ligaments & all the different Viscera in the three Cavities. It has been doubted whether this membrane exists in the Bones; it cannot be demonstrated in them, but it is very probable it may exist there, as well as in every other part of the Body that is vascular, which the Bones certainly are, but are so firm & rigid that this membrane cannot be traced thro their Fibres*.

This Membrane has 3 diffr. names given to it which take their rise from the diffr. appearances which it puts on in diffr. parts of the Body; these are, the Cellularis, Reticularis, and Adiposa. We have described it as existing in every part of the Body & lying immediately under the Cutis; and wherever it is found not much loaded with Fat, ~~it~~ as in the Back of the Hand, it is called Cellular; when the Cells are small & without Fat, so that the Cells are plainly seen, it is called Reticular*, and wherever it is loaded with Fat, as in the Nates & other parts, it is with propriety called Adipose membrane. It is allways of the Adipose kind, in Health, where it fills up the Interstices of the Large Muscles which are designed for much & strong Motion, as in the Thighs &c.; ~~it~~ there is likewise a large Bed of this Adipose kind in the Orbits of the Eyes; hence it is, that when People are become emaciated from long Illness, the Eyes appear considerably sunk in the Head as it were; which is not occasioned by any alteration or change in the Globe of the

*. Mr. Elve said, that he could not determine positively whether it was vascular or not; that he had been at diff.t Times of diff.t opinions, and ~~that~~ he owned that he now was divided in his opinion, but rather believed it was not —

the Eye but owing to the absorption of this Fat which was lodged at the Bottom of ye. Orbits — It will also become thicker by Pressure, as we see in the Soles of the Feet, and in Hands of hard working Men —

The external appearance of this membrane in every Part of the Body, whether of the Cellular, adipose or Reticular kind, is smooth & even, adhering very firmly by its Vessels to the Cutis: its internal Surface is very irregular, as it is designed to fill up all the Interstices of the Muscles, and likewise insinuates itself thro the Bodies of the Muscles, which must render it uneven; indeed it can't be said properly, to have an internal Surface.

It is disputed by some how this Membrane is nourished; but it is proved by Injections to be Vascular, tho' it appears perfectly white before it is Injected, as many other Parts do! notwithstanding it is thus demonstrated to have Vessels, yet some, and among these Haller, will tell us, that the Vessels which we see filled with Injection, are not Vessels proper to this Membrane & sent to it for its Nourishment, but only pass thro it to the Cutis, in the same manner as Vessels pass thro the Periosteum to the Bones: but is it not highly probable that these Vessels, in their Passage thro it to the Cutis should send off Branches which ramify upon it, as the Vessels sent to the Bones, do upon the Periosteum, which is proved beyond contradiction.* Tho' the Vessels in this membrane are not so numerous as in the Cutis: hence it cannot be said to be so vascular; and the Vessels belonging to this membrane must be so very minute, as not to be visible till they are injected: in like manner are the Vessels of the Cornea Transparens of the Eye, which appears very vascular when injected, but are so minute as not to admit red Globules of Blood to pass into them, unless when inflamed.

*. It is likewise yielding & elastic; the advantages arriving from which are evident where we find it covering Parts that are liable to be distended, as the Bladder, Intestines &c —

†. It is a common Artifice with Beggars to make a puncture into the Scrotum & distend it by blowing air into its Cellular membrane; by this means seeming to be afflicted with a Disorder when nothing is the matter with them — The Butchers likewise often throw air into the Cellular membrane of Calves, Sheep &c. in order to make them appear fatter —

†. A Blow given on the lower part of y^e. abdomen rupturing a Vessel, may cause an Extravasation throughout the whole extent of the Penis & Scrotum. of which M^r. Else mentioned an Instance —

We know that it is Cellular & that the Cells have ready & frequent Communications with each other throughout the whole Surface of the Body: This we have a convincing proof of, in the Anasarca & Emphysema*. This communication between the Cells, is more open in some parts than in others, i.e. in the reticular more than in ye Cellular, & more in the Cellular than in the Adipose: for Instance, if a Person recieves a Blow upon the Eyelids or Scrotum or any other part where this membrane is thin & of the reticular kind, if the Blow is so violent as to break down any of the Vessels, the Blood soon insinuates itself from Cell to Cell, for a considerable way about, as far as this membrane is of the reticular kind where there is not any Fat to obstruct its Passage: so that it is not uncommon to see a person with extravasated Blood all around the Eye, from receiving a Blow upon any part near the Eyelids; whereas, was a Blow given upon the Cheek or any other Part where this membrane was loaded with Fat, notwithstanding it might be given with great Force, scarce any Blackness would appear, at least but in a very small Compass, tho it might be attended with more Pain & Soreness than in the other Case: the Reason is obvious, the extravasated Blood is more confined by the Cells being loaded wth Fat.

This Membrane is the Seat of many Disorders: the Emphysema, Anasarca, Abcesses &c. — The Emphysema is a Disorder peculiar to this membrane alone, and is caused by the Air getting out of the Lungs into it and insinuating itself into its Cells, and unless a Stop is put to it in the Beginning, will pass from Cell to Cell throughout the whole Body, inflating it to an enormous Size, till the Patient dies. This Inflation in an Emphysema, is observed to be most considerable where the Cells communicate most freely, as in the reticular Part which is least loaded with Fat, and where it is thinnest; hence it is usual, when the Emphysema has extended over the Head & Face, to see the

*. A Putrid state of the Juices of the Body, will produce an Universal Emphy=sema; as in the Case mentioned by Doctr. Heapham, in which the Patient was afflicted with an inveterate Scurvy.

Eye-lids inflated to such a Degree as to cause total Blindness.

The Emphysema is most frequently caused by fractured Ribs, when they are forced inwards & the fractured Ends of ye. Bone penetrated into the Substance of ye. Lungs & wounded some of the air Tubes, from which, the air escaping, gets into this Cellular membrane & passing from one Cell to another may, if not prevented, insinuate itself throughout the whole Body. an Emphysema may likewise happen in consequence of a Wound in the Trachea, which is produced in the following manner; the air, in its Passage thro the Trachea, gets into the wound, which, either from it's being very Small, or if it has been large & the Edges brought together by the use of Sutures, will not afford a free Passage to the air; by which means the air by degrees insinuates itself into the Cellular Membrane, which had been divided by the Wound & easily admits the air into it, and produces an Emphysema — This membrane will likewise become Emphysematous from putrefaction, as is the Case in drowned Bodies, which after lying under Water several days, rise up & float upon the Surface of it. This Circumstance depends upon this membrane becoming Emphysematous or inflated wth. air, which is generated by Putrefaction, first beginning in this loose & less Vascular Membrane.

The Symptoms of an Emphysema are very apparent; viz, a white Swelling, without Pain, soon following the Fracture of the Ribs; when pressed with the Hand, a crackling noise is heard or more distinctly felt; it begins near the Fracture & spreads itself from thence over the Thorax &c. and it's progress will be in Proportion to the Injury done to the Lungs & size of the Wound.

For the Cure of an Emphysema, and an account of the opinions for and against Suffocation's being the Cause of the Patients' Death in Emphysemas, see Else's Surgery, Page 111 —

The next Disorder we shall mention, which has its Seat in this Membrane, is, The Anasarca. In this Disease Water is contained in the Cells of the Memb.ne Cellular., instead of air as in the Emphysema; and those parts where the membrane is Reticular & Cellular, will in this Disease be most distended; we find in anasarcous Patients, that the Legs all ways swell first & are most distended at Night; this is owing to the water making its way to the most dependent Parts as fast as it is extravasated, and we find, that in a Morning, after having laid in an horizontal Position the whole Night, the water will then be more generally diffused & the Legs become less, and the Eye-lids will sometimes be so distended as to cause a Blindness for some time till the Patient has been up some hours, when the swelling in these Parts will subside & the Legs from their dependent Position will become again distended with Water: this shews us very plainly what a ready Communication there is between these Cells —

I mean not to speak particularly of this Disease, but it is certain that the Water here extravasated, is lodged or deposited in this membrane by a Rupture of the Lymphatic Vessels, and we frequently see it absorbed again by the absorbent Vessels & suddenly discharged out of y.e Body by some of y.e Emunctories: a weakness & Lapsity of y.e absorbent Vessels may likewise cause an anasarca —

As I do not give an acc.t of any Surgical Operation, in treat.g of Operations, as indeed it does not deserve the name of an Operation, in the Cure of an anasarca, I will now mention it; and in doing of which, I will just mention the ways which were formerly directed. It was a common practice formerly, to make a large Incision 2 or 3 Inches long in the lower Parts of the Legs, as being the most dependant part of y.e Body, and it was thought that by making such large Incisions the water would be more readily discharged, which perhaps it might; but when ever these large Incisions were made, a Gangrene of the Limb was generally the Consequence, owing to the weak Sanguine Circulation in these Parts; for this Reason these Incisions were omitted, and in their stead, a small crucial Incision was made in 2 or 3 places in the Legs; but

The best method and what I have found attended with as great Success as either of these Methods, and attended with Less danger of mortification, is the making Simple Punctures with a Lancet in Several Places in the Small of the Leg; and these will be a Sufficient Drain for the Water to. I will however mention two Cautions to you in making them; the first is, that you be sure to make your Puncture deep enough; and the other, that in making them you take Care to avoid wounding the Saphena or any other Vein, as happened once to myself —

The Scrotum will become so distended sometimes as to endanger a Mortification, and therefore it is adviseable to make Punctures here, as well as in the Legs —

Speaking of this Species of Dropsy, I shall take an opportunity of mentioning a Species of Dropsy which is not taken notice of by writers; this is an accumulation of Water between the Peritoneum & Inner Surface of the Abdominal Muscles — This Case happened to a Woman who died in this Hospital; upon opening of whom, the Viscera of the Thorax & abdomen appeared to be perfectly Sound, but the Peritoneum was much thickened at least a ¼ of an Inch, and one of the Fallopian Tubes was stretched to 5 times its natural Length with the ovarium carried to a great distance from its natural Situation —

We have been speaking of Extravasations of Wind & Water in this Membrane, let us now mention Extravasations of Blood; this may be caused by Wounds, Blows, and Strains, and whenever it happens, we must endeavour to get it absorbed in the most expeditious manner, especially if situated upon a Bone as it may ~~cause~~ destroy the Periosteum & produce a Carries of the Bone; This is done by Fomentations with Spts & Vinegar, Pultices, Bleeding & procuring Evacuations by Stool. The most effectual application in procuring absorption, I have found to be the Lees of Wine; with which the Part is to be frequently fomented and a Poultice made with it, may be afterwards applied.

*. Whilst I was speaking of abscesses I might mention a circumstance which now & then happens after opening large abscesses, and was the case of a man, a Patient of Mr. Smith's, who died a few days ago. This observation relates to large collections of Matter under the fascial coverings of muscular parts; unattended, often, with any redness or inflammation of the skin; in which the cure is best performed by passing a Seton through the whole extent, rather than by an Incision. I have seen several cases of this sort, ~~rather than~~ where the Matter was lodged under the Fascia Lata of the Thigh. One of these happened in a young Lady in London whom I attended, and cured by opening with a Caustic in the most depending part, & the careful application of a Bandage. The other was in a negro Girl ~~of a~~ belonging to an old Planter in Virginia, which I cured by a Seton. B—

The Cellular membrane is the Seat of all Abcesses, Boils &c. and sometimes an abcess will form itself in this membrane between the Interstices of ye. Muscles, as in the Leg & Thigh, and the matter, not having any Spit, will insinuate itself further about and cause those Sinuous Ulcers common to those parts, and by its confinement will corrode & entirely destroy ye. membrane, so that upon opening these abcesses, ye. Muscles will appear quite naked & stripped of their Cellular Covering. It may be asked, why the matter formed in this Cellular membrane in small abcesses as Boils &c. and indeed in all abcesses, does not insinuate itself from one Cell to another as water does in the Anasarca, or Blood when it is extravasated? The reason of this is obvious; In all these abcesses, there first appears a Circumscribd Tumour, attended with Pain & Inflammation &c. till the Matter is perfectly formed, when the Pain abates, but the Inflammation still remains about the Edges of the Tumour, till the matter is discharge, when the Inflammation commonly goes off in 2 or 3 days: we know that the consequence of Inflammation is an adhesion or Cohesion of Parts in which it is situated & which were before disunited & separated; hence the Cells of this membrane being united by this Inflammation, this Union prevents the Matter from insinuating itself beyond the Limits of the Inflammation *.—

The Cellular membrane is the Seat of the adeps, and it is the opinion of some, that the oil is contained in the same Cells, which in an Anasarca, is filled with Water; but a celebrated anatomist is of a diffr. opinion, and thinks, that there is a particular apparatus of vessels for the reception & retaining this adeps — We must suppose there are a number of little Follicles or Bags, situated within this membrane, in which the oil is contained, but they cannot be demonstrated: and if this is the Case, we must likewise suppose, that they have vessels to carry Blood to them for their Supply & nourishment & vessels to return this Blood, with others which serve as absorbents: for it is beyond a Doubt that in Diseases, absorption of this adeps does take place; how can we else, account for a lusty Fat man to be reduced and emaciated

and emaciated by a violent Disease in 2 or 3 days time — The ana-
=sarca destroys the Cells which contain the adeps, and in chronical Diseases
we see People weakened & emaciated by an absorption of it —

The use of the adeps is to lubricate Parts which have motion;
hence it's use is obvious between those muscles which are subject to
much Friction in their ~~Actions~~; it likewise serves as a common
Integument over the whole Surface of the Body, serving to fill up
the large Interstices made by some of the Muscles, ~~which otherwise
would~~ & by that means rendering the Surface of the Body Smooth & Beautiful —
It is the Opinion of Some, that a particular use of this adipose mem-
=brane is, that when a Person is deprived of all kinds of Food, nature
will be supplied with an absorption of this adeps which serves as nou-
rishment to the Body when taken into the Blood, for several Days: and
it seems to be a reasonable Supposition that the Body may be sup-
plied with nourishment not only by an absorption of this, but like-
wise of every Fluid in the Body, [redacted]

The adeps or Fat is of Diff.t Consistence in People of Diff.t ages,
and it is also different in its ~~structure~~ & Consistence in different parts
of y.e same Body; it is harder and firmer at.t the Kidneys than
in any other part & is called Sevum: it puts on a different appear-
ance likewise in the Dead and the living Subjects —

Half Penniform Muscle.

Sphincter ani

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1. Tendon
2. Fleshy fibres -

Complex Penniform Muscle

Triceps

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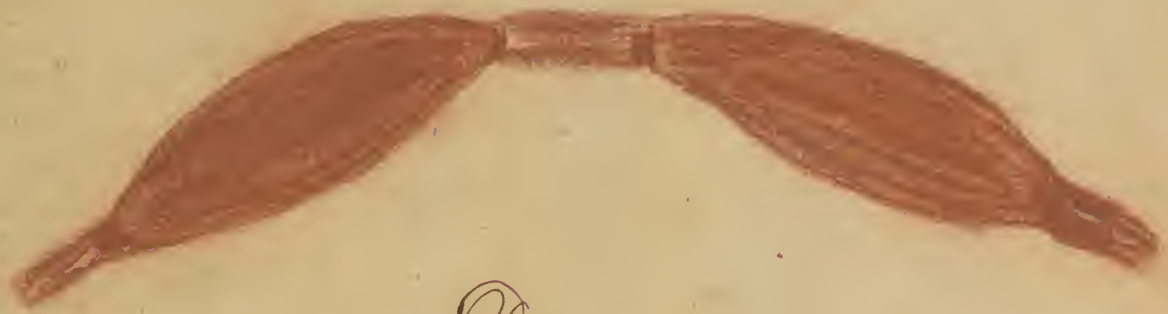
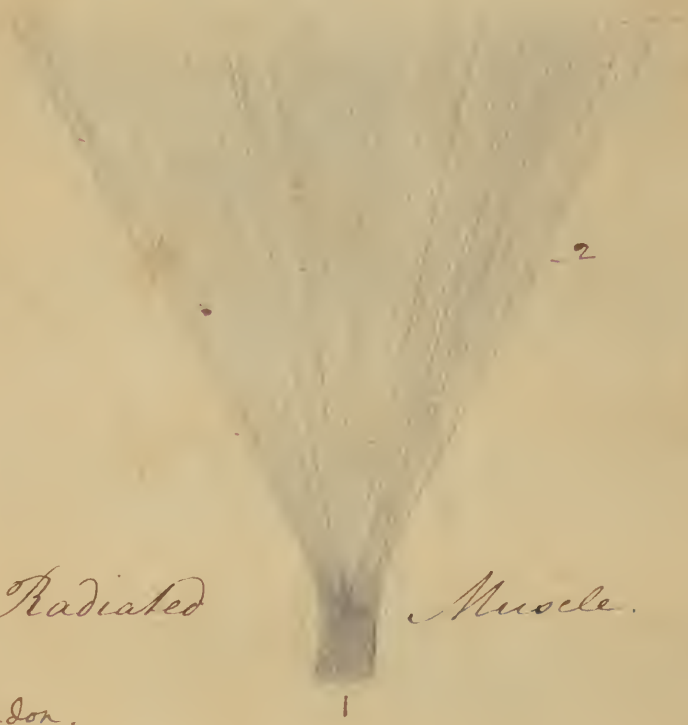


Digastricus or Biventer

Biceps.



Radiated Muscle.

1. The Tendon.
2. The fleshy or muscular fibres.

Rectilineal Muscle.

On the Muscles —

The Muscles are those Parts of Animals which we call Flesh: they are a Bundle of red fleshy Fibres connected together by Cellular membrane: the Muscles are the organs of motion and have a power of contracting, but how this is effected we are entirely ignorant of: the muscles have two appearances, the red, and the white; the red is what is called the fleshy Fibres, in which the power of Contraction is situated; the white is the Tendinous Fibres: these however are intimately blended together, and ~~closely connected together by~~ Cellular Membrane; the fleshy Fibres are loose, but the Tendinous are more compact & are inelastic, hence we know the Power of Contraction is in the fleshy Fibres only, and for this Reason, the Tendinous Fibres are looked upon to be passive organs only, which fleshy Fibres are solely the active —

In describing a muscle, it is usual to divide it into 3 Parts, the Head, the Belly & the Tail: by the Head we are to understand the origin of ye Muscle; its Belly or middle, is the fleshy part; and its Tail is the End or Extremity of it, which is commonly tendinous: but there are many Exceptions to this Rule; therefore, the Terms Head & Tail are laid aside & in their Places we have substituted ye Terms, Origin & Insertion. the Term Belly remaining. There are likewise objections to this Division, as it is often difficult to tell which is their origin or which their Insertion, if we are to understand by its origin what was meant by the Head of ye Muscle: for Instance, the Biceps of the arm, and many other Muscles whose actions are different in different Positions of ye Body, sometimes acting from their origin (i.e. ~~in that~~ part nearest the Head) and in other Positions acting from the Part which we term its Insertion. For this Reason the French have with propriety laid aside this division & make use of the general name of Attachment to both: and tho' I look upon this method of describing them to be the best, yet ~~the~~ Anatomists of this Country do not follow it —

The Muscles of the Human Body, take their names from their Figure, Situation, actions, attachments &c. as the muscles of the Tongue, called Hyoidei, from their attachmt. to the os Hyoides; the Sartorius takes its Name from the action; the Deltoid, from its supposed resemblance to the Greek Letter Δ — others take their names from the Direction of their Fibres, as the Recti & Transversales —

The attachments of the muscles as well their origins as Insertions, are various; some arise fleshy, others tendinous; and some are inserted fleshy & arise tendinous; some are lost in the Cutis and have no distinct origin or Insertion, and these are called Cutaneous muscles, as the Occipito Frontalis &c.; some are inserted into Bones, others into Cartilages, and the Periosteum; which last has the Slender muscles only, inserted into them, the strong ones, such whose actions are powerful are inserted into the Substance of the Bones, and those which are inserted into Cartilages, serve to give shape to the parts: but some muscles have no particular attachmt. at all, as the Sphincters —

When a Muscle arises from two different Parts, by two distinct Heads, they are called Biceps: when arising by three Heads, they are called Triceps: but sometimes the reverse of this happens in some muscles arising by one Head, and soon after, dividing into 2 Tendons; such are called Bicornis, and if they divide into 3 heads, Tricornis: we likewise see some muscles ~~arising~~ fleshy at their origin and Insertion but Tendinous in the middle; these are called Biventers, or Digastric muscles.

Authors speak of three Species of Muscles, viz, the Oblong, Hollow, and &c. Miped — the Oblong muscles are principally those of &c. Extremities, as the Sartorius, Biceps &c. the Heart is a Hollow Muscle, and the miped, are those of &c. abdomen.

There are several Species of Fibres in Muscles, as Rectilineal, Penniform, half-penniform, radiated and the Complex penniform. The Sartorius is the most perfect Rectilineal muscle in the Body; the Gastrocnemius the most perfect Penniform; the Trapezius & Temporal, the radiated &c. — These different Directions of the

Fibres

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Fibres of the Muscles have all their different uses: for by this means some parts of a muscle may be put in action whilst another part of it remains inactive. Tho this is contrary to the Opinion of some Anatomists, yet it is certainly true, and we have an Instance of the truth of it, in many muscles, particularly in the Orbicularis Palpebrarum proprius; the upper part of which we generally see in motion, whilst the lower part is inactive —

Muscles, when stripped of their Cellular Membrane, put on a red, fibrous or fasciculated appearance; but these Fibres are so minute, like those of ye. Nerves, that it is impossible to say what ultimate Muscular Fibre is: for when these Fasciculi become seperated from each other, either by boiling or maceration in Water, the smallest Fibrillo appears, when viewd thro a Glass, to be composed of still more smaller Fibres and so on ad Infinitum — It is disputed whether the muscular Fibres are hollow or not, and tho' this will admit of a Doubt, as we can't discover what an ultimate Fibre is, yet it is most probable they are hollow or porous like the Nerves, from the Effects produced by an Interruption or obstruction of the Blood Vessels sent to the muscles, which will produce a Paralysis of that muscle in the same manner as if an obstruction had happened in the Nerves sent to it. Seeing then, that ~~the~~ an Obstruction in either the Vascular or Nervous System will produce the same Effects upon the Parts of ye. Body which they are distributed upon, it is reasonable to imagine that they have both an equal share in producing muscular motion; tho Haller is of opinion that the Nerves are the Primary Cause of muscular motion and the arteries the arteries the Secondary or assistant Causes: but he made his Experiments relative to this Point, upon Frogs & other animals, and as their is a ~~very~~ very great difference between the Human & Brute Creation in their analogy, no just conclusion can be drawn from such Experiments: for Instance cut off the Head of a Turtle & dissect out the Heart and all the Viscera, and it will appear to have motion & Life for several Hours after; and the same Experim^ts. have been tried upon Frogs & other animals which are quite contrary to our Natures.

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Every Muscle hath its Artery, Vein & Nerve sent to it. and some have several Arteries sent & ramified thro their Substance; the Muscles have Lymphatics also: the Artery after entering the Substance of ye Muscle takes no Direct Course thro it, but sends off Ramifications w^h generally follow the Course of ye tendinous Fibres; and when a Muscle is minutely injected, it will appear one entire Congeries of Blood Vessels so closely blended together, that it will be similar to a Cake of wax, with which it is injected — The more Fibres a Muscle is composed of, the stronger it will consequently be, and the Longer the Fibres are, the greater will be the Action of ye Muscle, as all Muscles have a power of contracting themselves about one third of their Length, and all Muscles act likewise according to the Course of their Fibres — It is observed that the Nerve sent to a Muscle, enters in the same Course as the artery; but Willis is of opinion that it loses its Coats as soon as it enters the Muscle & the Pulpy Substance of it is distributed thro the Muscle in every Part in the same manner as it is continued over the Surface of ye Cutis —

Muscles by long Maceration in Water lose their red Colour and become white; this shews, that the fleshy Fibres owe their red Colour to the red Blood contained in their Vessels, and it is probable from hence, that they are a Compages or Series of minute Blood-Vessels. Some muscles however are different in Degree of Redness in diff^t parts of the Same Body; Some are quite pale, whilst others put on a Livid or almost black appearance: it is remarked that the Muscles of Executed Bodies are more Livid & red, than those who die a natural Death; owing to a greater quantity of Stagnated Blood in these Subjects, for wch Reason they are the properest Subjects for Dissecting the Muscles: Some will say, that the muscles, even in a relaxed State, are always endeavouring to contract & shorten themselves; tho this may be the Case in some small Degree, yet this opinion carried too far, has a dangerous Tendency; for, it was the adopting this opinion too hastily, that misleed the ancient & some of ye modern Surgeons to invent the various Instrum^ts for the Reduction of Dislocations; with which they made a very forcible & violent Extension, at the same time that the

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Muscles were put upon the Stretch by the Position of the Limb, in order to counteract this supposed Resistance of ye Muscles & by overcoming it to reduce the Dislocation; but every day's Experience now convinces us of the Cruelty of this Method and the inutility of these Machines in Dislocations; from the Position the Limb is ordered to be kept in when they are used it is reasonable to imagine they increase the very Inconvenience which they are designed to obviate; for all Muscles when they are extended or put on the Stretch, are, we know, in continual Endeavours to contract, and the Limb is ordered to be kept extended when the machines are used: whereas, put the Muscles into a relaxed State & the Dislocation is easily reduced with your Hands, which perhaps had forced the Operators who had used these machines. Hence we see the absolute necessity of being well acquainted with the attachments of Muscles, not only to know what do suffer by the Dislocation, but also to understand the most favourable Position of ye Limb for Reduct.n

What is called the Tendon of a Muscle, is only the white shining tendinous Fibres, which were seperated from each other, by the intervening fleshy Fibres when in the Belly of the Muscle, but now closely connected & united together so as to form a white shining inelastic Cord; and we have already observed that some Muscles have this Tendinous appearance both at their Origin & Insertion; such Muscles have commonly very powerfull actions and are attached to Bones at both Extremities, and commonly near the great Joints; which Mechanism is of considerable advantage, because they lie in much less compass, when thus united together & take up much less space in their Insertions, than if their fleshy Fibres had been continued to their attachments, in which Case, the Joints would have been considerably enlarged & rendered almost useless, by their Flexion being considerably impeded — These Tendinous Fibres when thus united, form a strong Cord, equal in Strength to the Muscle itself; and being inelastic will not give way, when the Muscles act; hence the action of ye Muscle is more powerful —

The Tendons, tho they appear white to the naked Eye, are Vascular, as appears by Injections; tho the Vessels are very minute; we have another proof, that Tendons are Vascular, because when divided they will unite; which is a proof beyond a Doubt, for, such parts as are

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not Vascular, as the Cuticle, Hair, Nails &c. will not unite, when divided — It was the Practice of ye. ancients, & some of ye. Surgeons to this day indeed, to make use of Sutures in Divisions of the Tendons; but the most emminent Surgeons have laid aside this method of Treatment, and recommend the divided Ends of ye. Tendon to be brought and kept as nearly into Contact with each other as possible, by Placing the Limb in a proper Position; and they have the Satisfaction to find this Method attended with so much greater ease & Success, that now, instead of confining the Patient to the Bed for 3 or 4 Months, as was the Custom when the Tendo Achillis was divided, they are only confined in a proper Position 2 or 3 Weeks, when they ~~Patient~~ will generally be able to set their Foot upon the Ground & begin to Walk ——

Lecture 7th. On the Glands

By a Gland is meant a Body of small Vessels performing Secretion, and none are properly Glands but such as do perform this Office; they take their Name from their supposed resemblance to an Acorn; they put on different Appearances & have different Names given to them from ye. diff. Fluids they Secrete. one some take their Name from their Situation, as the Mesenteric, Axillary, Inguinal &c. The Secretion of some Glands is Salutary, of others Excrementitious.

Glands were first divided into two Species, by Sylvius; and this Division has been universally followed by all anatomists since his Time; this is, into Conglobate and Conglomerate; but Malpighi has added another Class, to which he gives the Name of Follicular.

A Conglobate Gland is supposed to be Cellular internally, but its external Surface has a smooth, regular, even Appearance being covered by a fine, thin, smooth Membrane.

The Conglomerate has a fleshy, irregular, Cluster-like appearance, seeming to be composed of a number of small Glandular Corpuscles, which are externally covered by a fine, ~~thin~~ Membrane which firmly adheres to them, as the Pancreas, Parotid &c. These Corpuscles which form the Body of the Gland, are connected together by Cellular membrane, and may be seperated by maceration; when, each of them seems to be composed in the same manner as the Body of ye. Gland, viz, of still smaller Corpuscles, so that we cannot say what an ultimate Glandular Corpuscle is.

Some Anatomists object to this Division of ye. Glands, and for these Reasons; first, that the same Glands in Diff.t animals, will be of a Diff.t Species; i.e. that in one animal a Gland shall be of ye. Conglobate kind, whilst in anoy. Animal, the same Gland shall be of the Conglomerate Species; and again, that the same Gland shall at Diff.t Periods, put on Diff.t Appearances; that it shall at one time of Life be of ye. Conglomerate kind,

whilst at another time it appears to be of the Conglobate kind; an Instance of which is in the Kidneys.

With regard to Follicles; this Species as I before observed, was added by Malpighi, and are most numerous about the Eyes where any unctuous matter is to be secreted, and they are likewise very apparent on the Tongue —

By a Follicle is meant a little Bag which appears to have a narrow entrance but grows larger & larger as it proceeds to terminate either in the Excretory Duct, or on the Surface of any Part, as on the Tongue — The Tonsils are a Cluster of these Follicles, tho they appear to be distinct Glands of the Conglomerate kind —

All Glands have an Artery, Vein & Excretory Duct, belonging to them; and Malpighi is of opinion, that in all Glands, the Termination of the Arteries is partly in Veins & partly in Follicles; i.e. that the Artery entering the Gland, ramifies thro its Substance and some of its minute Branches terminate in the minute Branches of ye. Vein, which, joining, form the large Vein which brings back the superfluous Blood; whilst other Branches of ye. Artery terminate in the Follicles of ye. Gland; which are supposed to be little Bags, situated between the Termination of the Artery & the beginning of ye. excretory Duct of the Follicle, and these Ducts all uniting, as they Pass thro the Gland, form the common excretory Duct of ye Gland — Ruysch however positively denies the Existence of Follicles in any Gland, and says that the Vessels are continued into each other without any intermediate Cavity — The arguments on each Side of ye. controversy may be seen in a Series of Letters between Boerhaave & Ruysch —

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An argument made use of in support of ye. Malpighian Doctrine is, That they assert the Small Cysts of Pus found in diseased Glands to be Follicules diseased: but it is evident that they are nothing more than Hydatids, which may be found in many Places where no Secretion at all is performed, as, in the Ovaries &c. another objection to this is, that if these Cysts were Follicles, the matter contained in ym would in all probability partake of ye. Taste of the Fluid to be secreted by whatever Gland they were situated in; but this is not the Case — Many other arguments are brought in Support of this opinion, but they are of no Significancy; and, tho a very eminent Anatomist of ye. present age, has taken a great deal of Pains to establish & Confirm it, & some of his Preparations seem to shew their Existence, yet it is the opinion of much the greater number of anatomists that Glands have not Follicles, and follow Ruych, and I must own, that in all the Trials I have made, I never could discover any thing like them —

Some of ye. Fluids secerned, are used immediately, as Saliva &c. Others are deposited in Reservoirs from whence they discharged on particular occasions, as the Bladder, Vesiculæ Seminales &c. which after being contained some time, they occasion a Stimulus on the Coats of the Reservoirs which excites an Excretion of them —

We know that such a Gland secretes such a Fluid from the Blood; but how is this Secretion carried on, is the Question? I must own, that after all the opinions hitherto formed about it are very unsatisfactory, and that we are now as much in the Dark about it as ever. Ana-

Anatomists generally divide this operation into four Stages, viz, the Blood is first assembled for the Secretion of ye. Fluid, Secretion is then performed, the 3d. is, Depuration, & the 4th. is Excretion ——

Secretion is assisted by many Causes, and amongst them Pressure contributes not a little; and accordingly we find most of ye. Glands so situated as that they shall be liable to Pressure in most actions of the Body; an Instance of this is in the Salivary Glands, which discharge a greater quantity of their Fluid at the time we eat when it is most wanted; the same observation may be made in the Pancreas & Liver, both of which becomes compressed by the Stomach after a full meal whereby a greater Quantity of ye. Pancreatic Juice & Bile is forced into the Duodenum, which at this time is most wanted in order to assist Digestion of ye. alim. & Perfection of ye. Chyle &c —— and so of other Glands; as the Lachrymal Gland of ye. Eye, which secrete Tears as they are wanted to moisten the Cornea, by the Pressure it recieves from the almost continual motion of the Eyelids; and when any extraneous Body is lodged between the Eyelid & Tunica Conjunctiva of ye. Eye, we see what a continual discharge of Tears there is from the Gland, caused by its irritating & keeping the Parts in continual motion: this Gland is greatly affected by the Passions of ye. Mind, as Grief, which we all know

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to produce a Discharge of Tears from this Gland.
From these Observations it is easy to conceive that in Active People who use much Exercise, Glandular Secretion will be carried on & performed much more than in Sedentary People —

It is a Dispute with some whether there are any Medcys which will particularly affect a particular Gland, as Diuretics, the Kidneys &c. but I think there can be no Doubt but there are, tho' I do not Profess to be a Judge; this much, however, is evident from every Day's Experience, that Mercury will sometimes affect one & sometimes another Gland, sometimes causing a Spitting, which is indeed the most frequent, at other times creating a greater Urinary Discharge, great Perspiration &c —

All Glands do not perform Secretion at first Formation of them, but require a Considerable Time to acquire this Secretory Faculty, as the Testes, which do not perform Secretion till the Age of Puberty; and some only have this Power at particular Seasons, as the Glands of y. Female Breasts, which only have it at the Time Women give Suck.

There are some Parts of y. Body w.ch are known by the Name of Glands & yet it cannot be proved or demonstrated that they perform any Secretion; such as the Thymus: The Glandula Renales are not known to perform any Secretion, yet they keep the name of Glands.

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Lecture 8th.

On the Structure of the Bones —

The Bones are hard, solid & compact Bodies, serving for the attachment of Muscles and to give Shape & firmness to the Body.

They are divided into two Classes, ye. flat, and the Cylindrical; by the Flat Bones are meant all those which compose ye. Cranium, the Bones of ye. Pelvis, Scapula &c. By the Cylindrical are meant the Bones of ye. upper & Lower Extremities &c. —

All Flat Bones are composed of two Tables or Plates, which are Solid & compact, and have an oily Bloody Fluid lying in the middle between them, which is called the Diploe or Medullium — The Bones of ye. Cranium are commonly distinguished by their external & Internal Tables —

The Cylindrical Bones are formed of a number of Plates or Layers, very solid & compact externally, but internally they are Cavernous, loose & Cellular —

Bones are said to be fibrous, and that the Lamina or Plates are formed by these Fibres. How doth it appear that they are fibrous? If we look at a fresh Bone it appears to have a fine smooth Polished Surface externally, which is said to be caused by the Friction of the Muscles in their motion upon them, but it is not so; because was this smoothness caused by this means, it

would be wanting in some Places, as on the Tibia, where there are no Muscles, but we find this smooth appearance here as well as in other Parts; but it appears by maceration, that they are fibrous, and it is evidently demonstrated by the Calcination of Bones; In the fœtal State, they appear very distinctly fibrous. In the flat Bones the bony Fibres begin to shoot from the middle towards the Circumference; but in the Cylindrical Bones, Ossification is first begun & perfected in the middle, from whence the bony Fibres shoot towards each Extremity of the Bone, & It is thought by some, that there are the same number of bony Fibres continued to each Extremity of the Cylindrical Bones as there are in the middle of them; the middle being more firm & compact, the Extremities more loose & spongy: but this is certainly not the Case; for ~~by this Bones~~, if you take a Bone and cut an Inch in the middle part of it and an Inch into the Extremity of the same Bone, and the middle will weigh the heaviest: which seems to prove that there are more bony fibres in the middle than in the Extremities ——

It is the general Opinion of Anatomists, that these Fibres shooting over each other, form the Lamina or Plates in all Bones, as well Flat as Cylindrical. These Lamina are supposed to bear some ~~resemblance~~ Analogy in their Formation to melting Lead, throwing it upon a Floor & letting it cool, then pour more melted Lead upon it and let it cool, which will form anot. Layer; pour more Lead upon the last & another Coat will be formed &c. This Laminous appearance is most distinct & visible in the Bones of a

of a Fœtus when prepared; and the Bones of a Turtle, evidently shew the Fibres. The Osific Matter shoots differently in different Subjects, and the Bones of adults shew these Lamina in Exfoliations when they become diseased; and an Exfoliation may be procured by the application of a Caustic or any thing on the Bone, which destroys its Vessels, which nourished the external Lamina, causing a Seperation of the external Lamina thus deprived of its Vessels, from the Lamina situated beneath it, whose Vessels are not affected or acted upon by the caustic &c — These Lamina are said to be connected together by a Gluten or Jelly. — Internally, the Bones are more loose & cellular; the Cells are formed by bony partitions intersecting each other; they are called, at the Extremities of the Bone, Cancelli, but towards the middle they are called Reticular; these Cells have frequent communications with each other, which may be seen by pouring Quicksilver into them, and are supposed to be formed by the internal Lamina shooting over in different Directions; they are not found alike in any two Bones except in the Vertebræ where they are larger —

All these Cells are lined by a thin Membrane which incloses the marrow lodged within them: The Bones are said to be strengthened by them, and that by this Formation they are rendered lighter & fitter for action, than if they had been quite Solid, which would have rendered them more liable to be fractured — The Reticular are very tender & delicate & it is dubious whether they exist in every part of ye Bones —

All the Bones are exceedingly Vascular, but the greater part of ye Vessels sent to them carry white Blood; and

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There are two orders of Arteries which go to the Bones; one goes to the external Lamina, the other goes for the nourishment of the internal Parts, which last, are called Medullary arteries. They have their Veins likewise, as we may judge from analogy, but these cannot be so well demonstrated by Injections as the Arteries; there are a great number of Lymphatics also in Bones, and there are several Foramina which serve for the passage of y^d. Vessels: indeed, Bones have not only Arteries & Veins, but all the Vessels which other compound Parts have, except Glands. It is disputed whether they have Nerves, as we cannot trace them into the Bones with the arteries; but from their Sensibility in a Diseased State we may judge that they have. Haller produces the Teeth to prove that they are not Nervous, but as much of y^d. Teeth as are situated within the Gums has every property q^ch is similar to the Bones of other Parts, and is acutely sensible when diseased; so that it is no proof at all — It is my opinion that the Bones are not sensible unless diseased; and I am induced to think so, from observing that, People while the Cranium is sawing in applying the Trepan, seem insensible of any Pain; or, take a Sharpe Instrum^t. & cut upon the Bone & the Patient will not feel it, but take a rough Instrument, such as a Rasp, & scrape the Bone with it, and the patient will immediately complain of violent Pain; which Pain is occasioned by the Injury done to the adjacent Parts by the Rasp. This Experim^t. however is not decisive; we only know that they are acutely sensible when in a State of Disease —

In the Bones are seen many transverse & longitudinal Sinuses, the real use of which is not known; some

some say they are for the admission of Vessels, others for the Transmission of marrow —

Havers is of opinion that the use of the marrow found in Bones, is for the nourishment of them and to prevent them from being too brittle & liable to be fractured from very slight Causes. This marrow is observed to be more oily in the middle or Centre of Bones than towards their Extremities where it is bloody: the use of the oily part is to soften yd. Bones which are harder & more Compact in yd. middle, and the more bloody part serves to prevent yd. Spongy & soft parts of yd. Bones becoming too soft, which the oily part of yd. marrow would have occasioned; for the same reason we find more bloody marrow in Children than ~~oily~~ in those of Adults & less of yd. oily.

The Marrow is secreted by the medullary arteries, wch. generally enter the Cylindrical Bones obliquely, and it is contained in the Membrane wch. Lines the Bony Cells & Cancelli of yd. Bones (in which the marrow is lodged) and is called sometimes membrana medullaris or Periosteum internum; it cannot be inflated like the Cellular membrane —

The marrow of an Ox appears ~~appears~~ to be a series of little Globular Bdies, and the same in the Human Species, only it is much Softer — There are two Species of this marrow, one called Medulla and the other medulla mollis —

The Secretion in Bones is thought to be of the Vascular kind, as no Glands can be found in them —

The Bones are liable to many Diseases from their Vascular Structure: The Spina Ventosa is a Disease beginning in the internal or cellular part of ye. Bone & extending from one Cell to anoy. till it gets into the Joints — Exfoliations are the most common Diseases of Bones, and it is thought that new bony matter is formed before an Exfoliation happens — Some Diseases render the Bones too brittle, by destroying the oily marrow, hence they become easily broken; a remarkable Instance of this, happened lately in St. Thomas's Hosp.d. a Woman who was salivated for an inveterate Lues, had all her Bones rendered quite Brittle, by the venereal Virus destroying the marrow, so that upon the slightest Cause, they broke; and one Day, attempting to raise her Head, it fell forwards upon the Sternum, compressed the medulla Spinalis & she died immediately —

*. Processes at the Extremity of a Bone which are of an ~~oval~~ Figure are called Condyles, as at the lower extremity of of Femoris, Tibia &c —

Lecture 9th.

Structure of the Bones continued —

There are several Bones belonging to the Human Body, which cannot properly come under ye. Class either of the flat or the Cylindrical Bones; these are the Spherical, such as the Bones of the Tarsus & Carpus & the Patella. —

In several Bones of the Body, there are Eminences to be observed upon them, and to which we give the names of Processes; these have different names given to them according to their Size, Form & Use: where we meet with Bones which have a round Spherical Figure at either Extremity of it, it is called the Head, as in the os Humeri, Femoris &c; tho' we use the general Term, Head, to both Extremities in Cylindrical Bones, as upper & lower *. when we meet with Bones which are narrow & contracted before it forms this Head, this narrow part is called its Cervix, as in the os Femoris; and where we meet wth. a process of an Oval Figure, to this we give the name of Condyle, when it is received into a Concavity in another Bone, as the Condyles of the os Femoris, which with the Tibia &c. form the Point of the Knee; where we meet with a process broad at its Basis & running into a sharp ~~Point or~~ Edge, to this we give the name of Spine, as the Spine of the Scapula &c; where we have a deep Cavity in a Bone with a sharp Edge, to this Edge we give the name Supercilium; and what we mean by a Process, is an entire continuation of the Substance of the

*. The true use of the Epiphyses is to hasten Ossification, for by

Substance of the Bone, as the Processus acromion Scapulæ, and by means of these Processes, Bones have their principal degree of motion; they give strength to the Bones & serve to form Cavities & for the attachment of muscles & the articulation of yd. Joints; they also serve in many Places for the Direction of Parts —

The flat Bones are divided into their Edges & Surfaces, the Cylindrical into their Bodies & Extremities or Epiphyses — By an Epiphysis is meant an additional Bone placed at the Extremities of yd. Cylindrical Bones to check their growth, or they would be too luxuriant or perhaps irregular; these Epiphyses are very visible in young Subjects, being united to a Bone by an intervening Cartilage which in Adults becomes entirely ossified & hard as Bone itself: there are some Bones which have but one Epiphysis, i.e. at only one Extremity as the metatarsal Bones &c — the Term Apophysis is often used for Processes at the Ends of Bones, and they are Synonymous Terms; as the great Trochanter of yd. Femur —

& their Use —

There are two Sorts of Cavities in Bones, one for the reception of soft Parts, as muscles &c, the other for Bones &c. The most remarkable for soft Parts are the Cranium & the Orbits for the Eyes — those for hard Parts are divided into Glenoids, as Fossa &c. which are said to be formed partly by the action of the Muscles, as they are observed to be deeper in hard laborious Men than in Women & other men of more tender

*. But what is very Singular is that no other Part but Bone will be tinged red by the Madder —

and delicate Constitutions & who do not use much Exercise. Where we meet with a Cavity at first narrow & then growing wider, it is called a Sinus; and where Holes pass thro' y^d. Substance of y^d. Bones for the admission of Vessels, such are called Foramina; that thro' wch. the medulla Spinalis passes to the Spine is called Foramen magnum —

Bones are of different Colours in the Diff^t. Stages of Life; those of young Subjects are browner than those of adults & put on a reddish Colour which is owing to the greater Vascularity of the ~~same~~ young Bones, and we also observe them of Diff^t. Colours in different parts of y^d. same Bone; this is owing to there being a greater number of Vessels in some parts than in others —

Animals fed with Madder have their Bones tinged with a red Colour: this was first observed by M^r. Belchier when he was one Day dining with a Calico Printer, who used great quantities of madder; and he observed that the Bones of some Hogs which had been fed upon Madder were all tinged with a red Colour: This has been frequently confirmed by Experim^ts. since made upon other animals — The Enamel part of y^d. Teeth will not be tinged —

Madder will also tinge the fresh Callus of Bones after they have been fractured, and the Cancellous Part will be coloured by it also. *

Acids will dissolve Bones and render them quite Flexible; and if you feed an animal with madder till the Bones become red, and then steep them in Vinegar, they

+ which grow into Bone afterwards +

lose their redness, which shews that the earthy cretaceous matter alone is tinged. Madder will not Tinge the Gluten of Bones or the Vessels of their Combination.

The Combination of Bones is performed Differently, Sometimes they are combined by the Bony Fibres shooting into each other, as in the Sutures of the Cranium, others are combined by Cartilages, Ligaments, muscles &c. These have motion, the others have not —

Articulation of Bones, is the conjunction of two Bones to each other: Galen has divided articulation into three classes, and these are still continued; but they are of no use — Diarthrosis, Synarthrosis, & Symphysis —

The Assisting Parts or Appendages of bones are Cartilages, Ligaments, Glands & Vessels.

A Cartilage is a smooth, elastic Substance not so hard as Bone; and there are reckoned 3 Species, the fotal; those that give shape to Parts, as in the Ears, Larynx &c.; and those at the Extremities of Bones which have motion, and these last we shall consider —

It is Dubious whether Cartilages are Vascular: if they are, the Vessels are so minute as not to be demonstrated; they are said to be insensible, and are elastic in all parts of yd. Body; hence anatomists account for a person's being taller in the morning than in the Evening, by the Cartilages of the Spine giving way to pressure caused by the weight of the upper parts of yd. Body in an erect Posture,

but again recovering their Elasticity by Rest.

The Extremities of all the Bones designed for motion are tipped with Cartilage; without which they would be liable from their continual Friction, to be worn away; and by them, the bony Fibres are prevented from shooting or running into each other, as happens in an Anchylosis, when the Cartilages become destroyed; they likewise, from their Elasticity, prevent those Injuries which the Bones would be liable to, in Jumping &c.

Their Diseases are very few; tho' on opening Joints sometimes we find them destroyed —

Ligaments are strong, inelastic, insensible Parts, composed of a number of Fibres closely connected — They are of various Sorts; some bind down Tendons, & these are generally round; others surround the Bones which form ye. Joynts, & these are called Capsular or Bursal — The Capsular Ligament is most perfect in large Joynts which have much motion; it takes its name from its resemblance to a Purse or Bag, including the Extremities of ye. Bones so as to make a compleat Bag — The Bursal Ligaments are said to be composed of two Membranes; one is the Periosteum continued over it, & the other, the Internal membrane, is the Ligament itself ~~a Continuation of ye. Synchondrium~~

Ligam

which lines the external Surfaces of the Cartilages.

Besides these, there are other Ligam^ts, as the Ligament Teres or Suspensorium, the Cross round Ligm^ts of yd. Joynts &c —

When there is a total Dislocation of a Joint the Capsular Ligament is generally torn by the Dislocated Bone pushing thro it —

All the Ligaments are exceeding vascular; they are none of them perfectly round, but rather flat —

The Ligaments ~~which~~ of the Joynts, serve to limit them to a certain degree of motion and confines them properly in their Situations, & prevent Luxations; they serve likewise as bags to the Synovia, which lubricates the Joynts & renders them fit for action —

The Cross Ligam^ts are only found in the Knee; these Ligam^ts become thickened sometimes in Fractures of the Legs where the Limb is kept motionless & extended for any length of time, whereby a Stiffness ~~in~~ of yd. Joynt is brought about; but frequent Flexions of the Joynt with Friction &c generally relieve it ~~off~~ after some time —

+ Dura mater, Ligaments, Tendons &c. which is reasonable, as they seem to have a resemblance to each other in their Structure. It is said by some to be exceedingly sensible; which they attempt to prove by observing the extreme pain ensuing after striking the Shin against a hard Body; but this may probably is owing to the Injury done to the Cutis; another circumstance which they mention in support of this opinion is, that in amputations, the Patient is said to complain ~~[illegible]~~ of very acute pain when this membrane is

The Bones of the whole Body are covered by a thick, strong, inelastic membrane, called the Periosteum in every part but where it covers the Cranium, when it takes the name of Pericranium.

It is disputed whether the Periosteum is sensible or not: we know it is vascular, by Injection; but less so than the Bones themselves; some of whose vessels, as they pass thro this membrane to the Bones, ramify upon it for its nourishment: it is strongly attached to every Part of ye ~~Bones~~ external Surfaces of Bones by means of these vessels; and when this membrane is destroyed, an Exfoliation of the external Lamina of ye Bone ensues *.

It is thicker in the middle of ye Cylindrical Bones, than at their Extremities, where it is sometimes very thin as also on the Processes of Bones: It ~~does~~ is not continued over the Cartilages which tip the Ends of Bones, but passes on over the Joints, surrounding them entirely & forming the external Layer of the capsular Ligam.

In many parts of its external Surface it is rough & irregular, in others smooth & even: the Irregularities are owing to the Insertions of Tendons & Muscles into it, and the smoothness is generally found where the Bellies of muscles are found lying upon it.

It is disputed whether it is nervous or not, but it seems to be of the same Sensibility with the Dura + + not always —

is divided in order to make way for the Saw; but this may be owing to the Slip of a nerve, or a muscle being divided, or after the Saw is applied, hanging in the Teeth of the Saw —

One use, which those who say it is exceedingly sensible, attribute to it is, that it is formed upon the Bones to warn us when any Danger approaches or Injury is done to the Bone, which they look upon to be insensible: but this is certainly all imagination without any Foundation. Many other advantages are said to be derived from this membrane, but its principal Use seems to be from its making a Smooth Bed for the Bellies of muscles, by which they are prevented from receiving any Injury from the Hardness of the Bones, which they lie in contact with, during their Action —

It is liable to Inflammation, which sometimes causes only a thickening of it, at other times it will slough away: as it is an inelastic membrane, whenever we suspect matter or any other Fluid contained underneath it, we should not lose any time in evacuating it, as it may by Confinement render the Bone Carious. vid. Bell's Surgery, page — on nodes —

Lecture 10th on the Synovial Glands.

The Synovia is supposed to be secreted by small fatty Bodies situated in the Joynts, which from their resemblance have been called Glands: they have sometimes been called Glandulæ mucosæ & sometimes mucilaginous Glands. Their Situation, Size & Shape is various according to the Diff.t Sizes of y.e Joints. The largest is in the Knee; and they are all so situated that, every time the Joynts are moved, they undergo a Degree of Pressure, by which the Synovia is discharged from them, serving to lubricate the Ends of the Bones for the easier motion of the Joynt &c. We find all secretory organs very vascular; these are exceedingly so. The Fat of these Glands is sold for neats-foot oil.

The Synovia is a very slippery, mucilaginous Fluid, abounding in great quantities in some of the large Joynts designed for much motion, as the Knee &c. In performing Operations at the Joynts where these Glands are ~~seperated~~ situated, the operation will sometimes be rendered very troublesome by the discharge of the Synovia.

With respect to the quantity these Glands will seperate. we find that very small Glands are capable of secreting a large quantity of their Fluid at particular times, as the Salivary Glands, and these Bodies, whether they are secretory organs or not, when wounded will discharge a great quantity of Synovia; as we see in wounds w.ch penetrate the Capsular Ligam.t into the Joynt, which will be followed by a considerable discharge of this Glary Matter; and these Wounds are always attended with Danger, the Inflammatory Symptoms, running high with Pain, Fever &c.

and very often the Synovia will insinuate itself into the Cellular Membrane of the Parts adjacent, forming abscesses &c which destroy the Patient. These glands are not found in y. Shoulder.

I will find these Bodies described by almost all Anatomists; as Secretory organs, tho' I believe it will be difficult to demonstrate that they are Glands. The most favourable argum.t for their being Glands, is their Vascular Structure; and another Circumstance, which seems to shew that they are different from the Adeps in other parts of the Body & not Cellular, is, that in Dropsies of the Joynts upon opening the Joynts, these Glands only be found to contain no Water — There is some room to doubt whether they do secrete the Synovia or not, as they are not to be found in the Shoulder, which is as much or more used than any Joint in the Body, and a great quantity of Synovia is allways found in it; from this Circumstance, some have imagined that the Synovia is deposited in the Joynts by the Vessels terminating on the inner Surface of the Capsular Ligaments, in which likewise are Placed absorbent Vessels to reconvey any superfluous quantity. If then, these fatty Appearances are not Secretory organs, their use must be to fill up the Cavities in the Joints where they are situated as the Adeps does in other parts of y. Body.

That we have absorbent Vessels in the Joynts, is evidently proved in Dropsies of the Joynts — This Disease ~~may~~ is a Tumour of the Joynt ~~unat~~ attended with Pain, and having no Discolouration of y. Integuments, a Fluctuation very perceivable: this is the first Stage of the Disease, but when it is of long standing, it may be attended with bad Consequences. It may arise from

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from an Extravasation of the Synovia or a too viscid state of it, & likewise from a Relaxation of the absorbent Vessels, which I believe is most commonly the Cause, as we generally find them exist in relaxed Habits.—

In the Cure we are to aim at promoting an Absorption, which when the Disease is fresh, may generally be performed by Friction with the Flesh Brush, tight Bandages, & drastic Purgatives given now & then. Sometimes they will go off of themselves upon the patient's using an encreased Exercise & changing Climates.

It is Doubted by Some whether this Disease does even exist, but it certainly does.

There is a Disease which sometimes may be mistaken for this; which is an Extravasation of a Fluid under the Patella on the outside of the Capsular Ligam.t: and is said to be a Collection in the Saculi mucosi. But they may be Distinguished from each other by the ~~Extravasation~~ Fluctuation in this, being more evident, and the Tumour extends higher up the Thigh, than in the Dropsy of the Joynt.

It is said, that Synovia will not only grow viscid, but likewise become as hard as Bone itself. Hence the old opinion, in Luxations of long standing, that the Socket which formerly contained the Head of the Luxated Bone, was filled up by the Synovia which had grown hard & consequently prevent the reduction of the Luxation; but this is erroneous, as likewise is the opinion of the Stiffness of Joynts, after being a long time kept without Flexion, being occasioned by the same means; for there never was found the least

least appearance of concreted Synovia in any of the Joynts upon Dissection — The Cause of the Stiffness of Joynts, which very frequently happens after Fractures, is owing to the thickening of the Ligaments of the Joint, and unless remedied in Time by hot & Vapour Baths, Friction &c. may produce an incurable anchylosis.

Of Osteology & Ossification.

It may be expected that I should give some account of the Different Changes or Degrees of Ossification from ye. Embrio to the adult, but it would be taking up too much of our Time to little Purpose & prove but of little Satisfaction: those who are curious, may if they chuse it, see an account of the Diffr. Stages of Ossification, in

The Progress of Ossification is various in Diffr. Subjects; we see it compleated much quicker in some than in others, as in Ricketty Children, in whom it proceeds slowly — It appears, in flat Bones, to begin with a number of fine Threads shooting Divers ways; and in the Cylindrical a Smale Ring is first formed about the Middle of the Limb, from wher bony Fibres are afterwards sent off towards the Extremities. The first Stage of Ossification, the Bony Matter is said to be ~~like~~ of ye. Consistence of Jelly, the next Cartilage and at last it becomes hard.

There are various opinions with respect to the manner by which Bones acquire their hardness - Some say it is acquired by Pressure, from the Pulsation of the Arteries first, afterwards by the Pressure made upon the bony matter by the Bellies of the muscles; thus likewise they account for the Soft Parts becoming hard & ossified in old People as we see in some Parts of Arteries sometimes. But many objections occur in opposition to this Doctrine - If the Ossification is first begun by the Pressure of the artery, this would be surrounded first by Bone, which is not the Case; again, if the muscles advanced ossification, the Bony Fibres would take the same Course with the Fibres of ye. muscles, which is the case indeed with some of ye. large Cylindrical Bones, but not in the flat, and those Bones which wound be most subject to pressure would become ossified & hard first, which does not turn out; the Bones of the Ear receive no Pressure at all, and they are generally compleat in a Fetus of 12 months. In that it is not in the least probable that it is by this means ossification takes place -

The most probable & reasonable opinion is that of Doct. Nesbitt; which is, that the Bony matter is lodged between two membranes in some parts, as in the Cranium, & in others, in the middle of Cartilage; that there exists in the Blood a bony Cretaceous Matter, which is deposited by Vessels continually bringing it to its proper

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place. This seems to be the Case in the Ossification of the Patella, which when injected whilst in its Cartilaginous state, appears to have several white bony Spots, to each of which a Vessel is dispatched & seems to be spent entirely in it — according to this Doctrine, the Ossification of Soft Parts is most likely caused by a redundancy of this Bony matter in the Habit, and that this is the Case in Gouty Habits, in which we see Chalk Stones, as they are Called, lodged upon the Joints —

Doct. Nesbit denies that Cartilage is changd into Bone, but says, that the Bony matter is often lodged in the Centre of Cartilage, as in the Patella, Epiphysis &c. In an Epiphysis, we often see the first appearance of the Bone which afterwards forms the Epiphysis, in a little round Ball lodged in the Centre of a quantity of Cartilage; and this Cartilage is supposed to change by Degrees into Bone; but Dr. Nesbit proves that the little round Bone lodgd in the Cartilaginous Substance has no Connection (as would be the Case was it as was formerly supposed that the Cartilage changd into Bone) at all with it; for by maceration in Water they will entirely seperate & the little Bone will fall out of its Lodging in the Cartilage if there is a Section made thro the Cartilage. What then becomes of the Cartilage? The Bone, as it enlarges, causes the Cartilage to grow thinner & thinner by Degrees and

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at last entirely disappears —

The opinion of a French anatomist is very improbable & may be totally overthrown, tho' adopted by some very good anatomists, among whom is Palfin. The opinion is that the Bone is formed from the Periostoum; this one observation of ossification being begun in the middle of the Epiphysis, i.e. surrounded entirely by Cartilage, will prove the above to be erroneous —

Of Callus —

By Callus is meant the new Bone which unites the broken ends of Bones together after a Fracture: it is more solid & compact than Bone, but nevertheless is cellular internally —

It is formed by the bony matter issuing from the divided ends of the Bone; and Haller says that its progress towards ossification is the same as of the Bone itself, i.e. that it is first a Jelly, than cartilaginous, ~~and at~~ last becomes hard as bone itself. The uniting of the Callus is supposed to be performed in the same manner as the Cicatrization of Soft Parts which are united by Vessels; ~~are united by Cicatrices formed in the parts~~ as they both prove to be vascular by Injection; indeed all new Animal Substances are vascular, except the Cuticle: Haller says that the Callus is more Vascular than Bone, which he proved by an Experim^t. made on a Pidgeon — Tho' it

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it is said, that the Callus is formed from the Vessels of the divided Extremities of ye Bone, yet it is my opinion that Callus may be supplied from Vessels coming from other Parts; and I am induced to be of this opinion from a Case related by Mr. Gooch —

Callus is covered by Periosteum, at least by a membrane similar to it —

It sometimes happens that Callus will not be formed, as in the Scurvy which will even dissolve Callus, if we may believe what is related on this Subject in Anson's Voyage round the World; sometimes the Patient's Restlessness will prevent the Formation of it. In 2 or 3 Cases where Callus would not easily form, I have seen amputation performed; but I would never be too hasty in this. It will not form often, during Pregnancy, especially in large Bones; in small ones, I believe it may. This matter is not well understood & the Causes of it have never been clearly pointed out —

N.B. From this Lecture to the 30th Mr. Close is on Osteology & the Muscles; on which Subjects read Munroe & Douglas —

Practical Observations

which occur in speaking of the Bones; and first of the Cranium, ~~chiefly~~ respecting the application of the Trepan

The first taken notice of is the Os Frontis. This Bone is divided into its Surfaces, Edges, Processes, Foramina &c. — On the upper Edge of each Orbit in the Processes called the Superciliary, are situated a small blind Hole or notch, thro which Nerves and an Artery pass to be spent on the Forehead; These Vessels are sometimes divided by Cuts on the Forehead; when it happens that the Artery is divided at a distance from the Foramen, the Hemorrhage may be easily stopped by Bandages, Compresses &c. but if it should happen near the Foramen, the Artery may retract & it would be troublesome to stop the Hemorrhage, as Pressure in this Case cannot have any Effect & we can not come at the mouth of the Vessel to apply Styptics; we are to endeavour to stop the Bleeding by plugging up the Foramen with Lint, and if that should not be effectual, the only way remaining, is to make a Ligature on the Vessel in the upper part of the Upper Eyelid —

In the Substance of this Bone just above the Nose and on each Side of it are situated two, 3, 4 & sometimes 5 Sinuses, divided by a bony Septum, but all of them having a Communication with the Cavity of the Nose & lined w.th ~~the Pituitary~~ Schneider's membrane: These Sinuses, together with a Spine situated on the internal Surface of this Bone in its middle, render the application of y.e Trepan very dangerous & indeed impracticable; in any other ~~other~~ part of this Bone, the Trepan may be applied with safety; even over the Longitudinal Sinus, w.ch runs along the middle of this Bone; this however is to be avoided if possible & not to be done unless absolutely necessary, as in all operations, we are to avoid as much risque of Danger as we can — It;

In tracing a fracture of the left parietal bone in a young man I was obliged to cut through & to remove a considerable portion of this muscle. The patient got well and appears to have sustained no inconvenience from it, except a little uneasiness in chewing at first. I made four perforations with the Trephine; the last near the anterior & inferior angle of the parietal bone. The hæmorrhage from the temporal artery, which was divided, and some of its branches, was easily stopt by the needle & ligature

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It is worth our while to remember that these Sinuses are rarely if ever found in young Children, & not often in Women —

We are not to mind what Authors tell us respecting the application of the Trepan on the Sides of this Bone, on acct. of the attachment of the Crotophite or Temporal Muscle to that Part of it, wch. must be divided, & which they say, will not easily heal, occasioning locked Jaws &c. Some of you have had an opportunity of seeing the Uselessness of this Observation & Caution in a Boy whom I lately Trepanned, where a large Portion of this Muscle was removed; & the Boy is now near well, having had no ill Symptom found but on the Contrary has been remarkably well ever since the Operation

Of the Ossa Parietalia.

These Bones allow a large Scope for the application of the Trepan, there not being any Part of it, but what, upon emergencies, it may be applied; but it is seldom that we are under a necessity of applying the Trepan upon the Suture wch. Connects these two Bones which is the most dangerous Part to apply the Trepan on, on account of the Longitudinal Sinus running immediately under it: it may, & has been done, however, both by Mr. Warner & Mr. Pott, without injuring the Sinus: The Trepan would be dangerous on the lower Part of anterior & inferior Angle of this Bone, where the Artery of the Dura Mater runs between the two Tables for a Small Distance; but this is seated so low down towards the Basis of the Skull that the Trepan could not be easily applied on it. There are in some Skulls, sometimes one & sometimes 2 small Holes, near the edge of the Sagittal Suture a small distance from the Posterior Superior angle of this Bone, which serve for the transmission of Vessels: a Hemorrhage is sometimes troublesome from these

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arteries, if divided, at or near their exit thro these Holes —

Of the Os Occipitis —

It is seldom we are obliged to apply the Trepan on this Bone: it has been done however, on the upper part of it & rather to one side, as appears from a Skull Mr. Else shewed us. Mr. Else himself lately had occasion to apply it on this bone; which he did just below the Lambdoidal Suture between it & the ~~to~~ right lateral Sinus. The patient lived several weeks & then died.

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Of the Ligaments, Cartilages &c.

The Ligaments are divided into Classes; viz, the Bursal or Capsular, which surround the Joints; the Round, which serve to connect the Bones of ye. Joints, as in the Femur & Acetabulum of ye. Os Innominat.; the Crucial, which are nothing more than two of ye. Round ones crossing each other, as in the Knee; and the flat, which serve for the attachmt. of Muscles, connecting two Bones longitudinally, binding down Tendons &c.: those which connect two Bones in a longitudinal Direction as the Tibia to the Fibula, are called Interosseii. They are composed of strong membranous Bodies of Fibres closely united, and are similar to the Tendons, being all of them inelastic in their Nature, at least they will stretch or give way but very little. Some serve to connect Soft Parts, others hard: of the first, are the Ligaments of ye. Uterus &c.; & the last are those which connect Bones, and of these I shall chiefly speak, confining myself to those

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those only which are the most remarkable —

Of ye Ligaments of ye Spine —

Winslow describes Ligaments running longitudinally upon the Spine externally, but they are very inconsiderable: on the inside of ye Spine there is a ligamentous Substance which serves as a sheath to the Bodies of ye Vertebræ: and each Spinal process is connected to the other by a small flat Ligament — There is a strong ligamentous Substance which connects the Basis of the Cranium to the Processus Dentatus of ye Cervical Vertebra, which serves to preserve the Process. Dentat. in its proper Situation, and to prevent the Head from falling forwards &c. it is situated on the internal Surface of the Vertebræ of ye Neck & runs longitudinally over their Bodies —

Between the root of each Spinal process & each oblique Process is placed a yellow Ligamentous Substance which in Flexions of ye Spine gives way & again recovers itself when the Spine is erect: it has not the shining appearance of ye white

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white inelastic Ligaments —

Between each of ye. Vertebra of ye. Spine is situated a Ligamentous Substance, called Intervertebral Subst.ce which on the outside resembles Cartilage, being harder & more compact than in the middle where it is soft & pulpy — It is thickest on its internal Edge & gradually grows thinner towards the external Edge. It exists much plainer in young Subjects than in Old; in the latter it often becomes more firm & hard and its attachm.t to the Vertebræ stronger by which means it prevents the free & easy Flexion of ye. Spine, brings on an anchylosis between some of ye. Vertebræ which causes an incurable Stooping &c.

Of ye. Ligaments of ye. Upper Extremities.

The Ligaments of ye. Clavicle have nothing in them remarkable. This Bone is connected at each Extremity by a Short Capsular Ligament, which admits of some little degree of motion; the Extremities of it being tipt with Cartilage — The Luxation of this Bone at the articulation with the Sternum is not very common tho' it does sometimes happen; for which, vid. Elves Surgery —

Between the Acromion & Coracoid Processes is placed

a strong forked Ligament which connects these two immoveable parts —

The Superior Extremity of ye. Humerus is connected to the Scapula by a Capsular Ligament which is longer than that of ye Femur at its articulation with the os Innominat. tho a smaller Joint, in order that the motion of this Joint might be the greater: it is a very perfect Instance of ye. Capsular Liga=ment, and this Joint has no round Ligament as the Joint of the Femur & os Innominatum, but is preserved in its place, i.e. the Head of ye. Humerus is preserved in its acetabulum by this Ligam^t. & muscles surrounding it. This Ligament is connect=ed to the Brim of ye. Acetabulum, from which it is re==flected on & lines the internal surface of ye. Acetabulum; it is connected to the Cervix of ye. Humerus at the ar=ticulation with the Epiphysis & is reflected over the Cartilage which covers the Head of ye. Bone — within the Capsular Ligament of this Joint lies the Tendon of the Biceps muscle running to be inserted into the upper part of ye. acetabulum Scapulæ, and serves in some measure the Purpose of a round Ligament to this Joint by preventing [illegible] Luxations. As Tendons are inelastic this Tendon is sometimes torn in Dis=

Dislocations, and when it is, the Joint remains weak for a great length of Time and the Patient is not able to lift his arm up to his Head, notwithstanding the Luxation was well geminedately reduced — And sometimes this Tendon is Dislodged from its Sulcus in the Bone; which is attended with Violent Pain and an Inability to move the Limb as in a Luxation; It may be easily replaced with the Hands after relaxing the Muscle —

There are no Synovial Glands, as they are called, in this Joint —

The Capsular Ligament of this Joint, often lacerated — always in Dislocations, by the Head of the Humerus pushing thro' it; vid. a Case published in the Lond. Med. Obs.ns by Mr. Thompson: and it is often lacerated by the Violent Force used in Reductions of y.e Dislocated Bone —

These Capsular Ligaments are said to be composed of two Lamina one external, the other internal; but the external Coat is nothing but a Continuation of y.e Periosteum — It is observed that the Capsular Ligaments where they have the most motion are the thinnest, and in such Joynts as

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as have but little motion they are thickest; and they are likewise of Diff.t Thickness in different Parts of y.e same Joynt, as in the Elbow; whose Capsular Ligament is thinnest anteriorly and posteriorly; and thickest laterally, where on acco.t of this Thickening there has been described 2 other Ligam.ts, called the Brachio-radial & Brachio-Cubital; but they are nothing more than these thickenings of y.e Capsular Ligament — The Coronary Ligament of this Joint is a Plan of Fibres continued from the Capsular Ligament and taking a Circular Course round the Head of y.e Radius serving to give it Circular Motion —

In this Joint there are 3 fatty Substances called Synovial Glands; one of them is very large & situated in the Cavity in the Extremity of y.e Humerus which receives the Olecranon of y.e Ulna —

The Radius & Ulna are connected to each other by an Interosseous Ligament, in which as in the other Interosseous Ligam.ts there are Perforations thro which Arteries & Veins pass — It is this Ligament we should carefully divide in amputations of y.e arm below the Cubit before we apply the Saw, as it will be apt to clogg the Teeth of y.e Saw and prevent its

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its working freely —

The Radius & Ulna are connected to ye Carpal Bones at the wrist by a Capsular Ligament similar to those of ye other Joints —

At the anterior & posterior Part of the Carpus is placed a Ligament running transversely & serving to bind down the Tendons of ye Flexor & Extensor Muscles of the Hand —

The Ligament Transversale vel annulare Carpi is that situated at the anterior part of ye Carpus, and is a very strong Ligament serving not only to bind down the Flexor Tendons of ye Hand but likewise for the attachment of some of ye Muscles of the Hand, and to prevent the Bones of the Carpus from receding from each other, being in general attached to the 5th & 8th Bone of ye Carpus —

There are Several Synovial Glands in the Joint of ye wrist —

Ganglions are hard white Tumours, commonly without Pain and situated generally upon the Tendons: they are formed by an Inspissation of ye Viscid Gluey matter which besmears the Tendons in all parts; they are encysted Tumours & have

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have their Cyst formed by the Cellular membrane surrounding the Tendons —

The Treatment of incipient Ganglions is by Pressure to prevent the further accumulation of the matter, by mercurial Plaisters &c — They have been cured in their Infancy by sudden Blows upon them and wearing a continual Pressure with a piece of Lead; for by these methods the Fluid contained in the Cyst is forced out and is afterwards absorbed — Small Ganglions may be opened by Incision without much Risque but large ones when opened are generally attended with violent Symptoms — The Method which I look upon to be the best in opening Ganglions is this — The principal Cause of ye. violent Symptoms Supervening an opening made into these Tumours is the Exposure of ye. Tendons to the external air; therefore in order to obviate this, the Integuments covering the Ganglion should be drawn aside and kept Stretched till an Incision is made into the Cyst of ye. Ganglion and the Fluid contained pressed out; after which the Skin is suffered to recede into its natural situation, by which means, the Wound in the Skin being at a distance from that made into the Cyst of ye. Tumour, all Communication between them shut off & the air is prevented from having any access to the Tendons; a Piece of Sticking

Plaster

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Plaister is to be applied over the Wound with a Piece of Lead secured upon it in order to make a moderately light Pressure upon the Part to prevent a further accumulation of Fluid; and what is left in the Cyst, as it cannot all be pressed out, will be absorbed. — This method has succeeded several Times without any violent Symptoms, and is preferable to any other Method — If ye Ganglion shond be large & this method shond fail, a Seton may be passed thro' it, wch will cure it without exposing the Tendons — Mr Baker thought that as the Caustic Cured in the Hydrocele, it might probably answer ~~as well~~ in these Tumours; but in the Hydrocele the Scrotum contracts itself as the Sloughs of ye Tunica Vaginalis comes away, and by that means prevents the access of Air to the Testes; in the Case of the Ganglions it is different, for here when the Slough occasioned by the Caustic comes away, the Integuments not having that contractile Power as in the Scrotum, the Tendons become exposed to the Air which dries them & brings on violent Inflammation &c. for which Reason tho' Mr Baker succeeded in one Case yet I think the Practice is not to be recommended — Mr Sharpe when Surgeon to Guy's Hospl attempted the Cure of Ganglions when large by removing

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an oval piece of the Integuments & dissecting out the Cyst; but by this method the Tendons & Ligaments were laid bare and the Patients not only generally lost their Limbs but narrowly escaped with their Lives.

As these Ganglions are caused by an Inspissation of ye. Glary viscid matter which every where lubricates the Tendons, we oftener find Ganglions situated upon the Flexors & Extensors of ye. Hand; for being very numerous, more confined & closer together under & near to these Transverse Ligaments that bind them down, a greater quantity of this Fluid is necessary and is allways found here; and being situated so near the Joynt are more dangerous; for if the Fluid is suffered to remain in the Cyst till it bursts of itself, it has commonly become acrid & destroyed the Joynt & insinuating itself among the Tendons, unless immediate recourse is had to amputation, the Patient generally loses his Life from the violence of ye. subseqt. Symptoms; and if they are opened by Caustic or Incision as formerly, the consequence is the same; therefore the Method I have laid down, I look upon is the most promising to obviate this Mischief — The

Ganglion

N.B. Mr. Sharpe imagines there is not so much danger as is said to be in the Division of the ligament. transvers. Carpi, & that the Objections to its being done are not of much Conse=quence; and therefore when Surgeon to Guy's Hospl. he divided it once in a man who had a large Ganglion under it: but tho' he succeeded in it, yet the Symptoms of Inflammatn. run so high that the Patient ~~narrowly~~ escaped losing not only his arm but his Life — Mr. Warner likewise has done it more than once — But for my own part I cannot approve of it —

Ganglion most to be dreaded is that situated under the Carpal Ligament as we cannot come at it for the Cure without wounding this Ligament, and when they grow to any size, by pressing the Ligam.t upon the Wrist & compressing the Tendons they make great pain & prevents the Flexion of the Tendons — N.B.

There are other transverse Ligaments placed at the Extremities of y.e Metacarpal Bones towards the Fingers under which the Flexors of y.e Fingers pass; and there are likewise at every Joynt of y.e Fingers strong ligamentous or tendinous Fascia to keep down the Tendons, under which Matter often forms and causes what is called a Whitlow — In these Cases the matter cannot point easily outwards in the Fingers or Palm of y.e Hand and therefore we often see that the matter insinuates itself backwards pointing upon the Back of the Hand, and sometimes above the Carpal Ligament on the inside of y.e Wrist, in which last Case the Bones of y.e Carpus &c. are often, indeed generally, Carious & Amputation is often necessary; this may be prevented by timely making an Incision down to the Bone, and dividing by that means the Tendinous Fascia which being inelastic will not give way to the

Matter

matter for it to point externally untill much mischief has been done: if at any time we shoud suspect matter to be confined in any of these Plans & shoud proceed with the Incision and find no matter the Injury will not be great; but if the contrary shoud turn out much Mischief will be prevented — This Rule holds good in every part of ye. Body wherever we suspect Matter to be formed under the Tendinous Fascia, as of ye. Temporal Muscle &c —

Of the Ligaments of ye. lower Extremity & Pelvis — There are a great many Ligaments belonging to the Pelvis, the principal ones are the Sacro-Sciatic & Obturatores — The Sacro-Sciatic Ligaments run from the Sacrum to the Acute & Obtuse processes of ye. Ischium. The Obturator fills up the great Foramen Ischii thro wch. the Obturator Vessels pass into the Thigh ——

The Capsular Ligament of ye. Os Femoris at it's Articulation with the os Innominatum is similar to that at the Humerus, but within it there is anoyr. Ligamt. called called Ligamt. Teres, which is fixed into the Bottom of the Acetabulum and in the middle of ye. Head of ye. os Femoris: this Ligament prevents a Luxation upwards & outwards, & in this Species of Luxation this Ligamt. I believe is allways ruptured: it has

some —

sometimes been found ossified in old People, in which Case it may occasion an Inability to move the Joynt. The Capsular Ligament serves to resist a Luxation in some Degree in every Direction — At the Bottom of the acetabulum is a large Synovial Gland, which sometimes increases so much as to throw the Head of yd. Bone out of yd. Socket —

At the Knee there is a Strong broad Ligament which goes off from the Patella to be inserted into the Tibia connecting these two Bones together — a Rupture of this Ligament sometimes happens which may easily distinguish, and the Treatment consists in keeping the Patient in Bed with his Knee Straight making use of Bandages, Splints &c. till it is united —

The Capsular Ligament of this Joint is very Short, is thinner anteriorly & posteriorly than laterally: the 2 lateral Ligaments are only parts of the Capsular as they cannot be seperated — Within the Joint there are two round Ligaments which cross each other and for that reason are called Crucial Ligam^ts. The largest Synovial Gland in the Body is situated in this Joynt —

The Capsular Ligam^t of the Knee contains & encloses the Water in a Dropsy of this Joynt which Mr Baker has attempted to cure with the Caustic, but he was

disap-

disappointed; and the best method of treating them is with moderately tight Bandage and drastic Purges given at proper intervals —

On the upper part of the Tibia are placed two Semilunar Cartilages upon which the two Condyles of the Femur rest —

The Tibia & Fibula are connected by an Interosseous Ligament; which we are carefully to divide in amputations of ye. Leg before the Saw is applied.

The Joints of the ankle & Foot are surrounded by Capsular Ligam^ts, as in the wrist & Hand &c. besides a number of other Ligaments which will not admit of a seperate Description; they are all much stronger in the Foot than the Hand as they support the weight of ye. whole Body.

all the Bones of ye. Tarsus have a small degree of Motion upon each other — It often happens that matter will be formed among these Bones, & from a Presumption that all the Bones are Carious, Surgeons allways recommend amputation of ye. Leg: but if we could be certain that only one or two of the Bones were affected, the Limb may be saved by extracting the Carious Bones, which I once saw done by an eminent Surgeon of this Hosp^l. & the Patient did well with ye. Inconvenience only of a little Stiffness in ye. Foot. —

Of the Viscera —

The Viscera are the Contents of ye. three great Cavities of ye. Body, that of ye. Cranium, Thorax & abdomen; of which the smallest is the Cranium, and that of ye. abdomen by much the largest — We shall first examine the Contents or Viscera of ye. Cranium, which are called by ye. general Term ~~the~~ Encephalon —

After removing the Cranium the first that presents itself to our View is the Dura Mater which surrounds the Brain in every part; under it we have the Pia Mater which lies in immediate contact with the Substance of ye. Brain — The Brain is divided into three Parts, viz. the Cerebrum, the Cerebellum & medulla oblongata; the Cerebrum is much the largest of the three & the medulla oblongata the smallest — The Cerebrum is situated anteriorly, superiorly & posteriorly; the Cerebellum posteriorly & inferiorly; and under it the medulla oblongata is placed, immediately before the great Foramen, and passing thro it to the Spine is called medulla Spinalis, carrying along wth. it as it passes the Dura & Pia Mater as its Coats or Coverings — The Cerebrum is divided into two Portions called its Hemispheres by a Longitudinal process of the

the Dura Mater called the Falx, and each of these Hemispheres are divided into 3 Lobes, the anterior, middle & Posterior; the last of which lies immediately over the Cerebellum, which is divided into 2 Lobes — I shall first examine the Coats or Membranes of the Brain & afterwards speak of its Structure —

The Brain has two proper membranes or Coverings called the Dura & Pia mater; and some say that it has a third which they call Tunica arachnoides, but if this is allowed to be a Membrane of ye Brain it is only a partial one & perhaps does not exist in all Subjects; in any Subject it can only be found in a small proportion lying between the Dura & Pia mater at the Posterior part of ye Brain towards its Base.

The Dura Mater is the external Coat, and is a strong, thick, inelastic membrane of a white glittering appearance in a sound state: the external surface appears to the Eye smooth & even, but when put into Water there appear many small Filaments attached to it & floating in the Water, which are nothing but its Vessels and not processes of it as is said by some — It adheres to the Cranium internally by its Blood-Vessels, and this adhesion is most strong at the

the Sutures, which is occasioned by the Bones of the Cranium when they first meet & unite to form the Sutures taking in a part of this Membrane between their Indentations; this adhesion however at the Sutures is much stronger in Infants & young Children than in adults; it likewise adheres very strongly at the Basis and different Foramina of y^d. Skull at which it meets with the external Covering of the Cranium the Pericranium and adhering to causes this adhesion.

The internal Surface is smooth & polished and is seperated from the Pia mater by a small qty. of pellucid Fluid like that of y^d. Pericardium; but there is a slight adhesion of these two membranes in places where the Veins of the Pia mater raise the Dura mater into the Sinuses: this Fluid is deposited by Vessels as no Glands can be found there — The Dura mater is said to be composed of two Laminæ, and that the Sinuses of Cranium were formed by the external, and the internal Processes of this Membrane were continuations of y^e. internal Lamina; but this is not the case as it cannot be seperated but by Violence —

The Dura Mater has external & Internal Processes; the most remarkable of y^d. external is at the great Foramen, and where the nerves go out they are every where surround by this membrane — The internal Processes are 4; the Longitudinal or falciform, 2 Transverse, and any^r.

Small

small one which divides the two Lobes of the Cerebellum. The falciform begins at the Crista Galli of y^d. os Ethmoides & passing along ye middle of the Os Frontis, & under the Sagittale Suture, till it gets a little beyond the Lambdoidale Suture where it divides into the two Transverse, the falciform divides the Cerebrum into the two Hemispheres, and the Transverse divides the Cerebrum from the Cerebellum, preventing the first from pressing too much upon the latter; and the fourth Divides the Cerebellum into its two equal Lobes — These Processes are sometimes Ossified which is said to have been the Case of one in His Royale Highness the Late Duke of Cumberland. The Structure of these processes is very singular, for if you carefully take off the Dura Mater, they will appear as firm & streche out, as in a dried State, but thrust the Point of a Lancet or even a Pin thro any part of them, & the whole will immediately Sink down and Collapse.

The Sinuses are cavern receiving Blood from all the Vessels of y^e. Brain & its Membranes, and are in reality nothing but Veins, but they are rather thinner than the Veins in other Parts of y^e. Body: they are of a Triangular Shape, and their Situation, which we ought to be well acquainted with, is very where behind the internal Processes of y^e. Dura Mater; so that if we understand the Course of y^e. one we may of y^e. other. The 4 Principal ones are, the Longitudinal, 2 Lateral, and the Torcular: some describe 13 or 14, but none are of any Consequence except the 4 Just mentioned, the Course of which is of much Consequence to

to be understood —

The Longitudinal begins at the Crista Galli where it is small & runs along behind the falciform process increasing in size in its Progress towards the Lambdoidal Suture where it divides into 2 Lateral which run behind the Transverse Processes of ye. Dura mater & go to terminate in the Jugular Veins — The Torcular Herophili is situated between the Cerebrum & Cerebellum on the upper part of ye. latter in the middle between its two Lobes, and receives the Blood from the Plexus Choroides — The Course of ye. Circulation in these Sinuses is from before backwards: they are said to receive Blood from arteries terminating in them, but the finest Injection will not pass into them by the arteries, whereas any Coarse Injection will pass into them by the Jugular Veins, for they have no Valves, and they may be distended by throwing air into one of ye. Veins which plainly shews their communication; the Pulsation which is observed in them & caused the Conjecture that arteries terminated in them, is occasioned by ye. motion of ye. Brain, which the Pulsation of ye. Sinuses obeys. On the internal Surface of the Sinuses are a no. of small white Cords, called Cords Willisii, which run from one side to the other and strengthen & prevent a too great Distension of them — Polypous concretions are allmost allways found in the Sinuses.

It has been laid down as a Rule not to apply the Trepan upon the Sutures of ye. Cranium for fear of wounding these Sinuses, as no application whatever can be made use of to restrain the Hemorrhage; but many Instances have been given by some late Surgeons of their having been wounded & the Patients did well:

Mr.

Mr. Warner lately met with a Case where the fractured Bone was depressed upon the Sagittal Suture; he removed the fractured Bone and the Sinus was found to be wounded, but there was no profuse Hamorrhage and the Patient did well. Mr. Pott has twice applied the Trepan and extracted Bones that were forced thro these Sinuses with Success, but it was on the fore part of ye. Head where the Sinus is but small — Some have lately punctured the Sinuses purposely, in preference to bleeding in the arm, when they have been laid bare in Fractures of the Cranium without being wounded; but this I wond not recommend, nor the application of ye. Trepan upon the Sutures unless there was an absolute necessity for ye. Relief of ye. Patient, and when this is the Case I wond not hesitate about doing it if it was on the fore part of ye. Head where the Sinus is small; but on the back part where they are large, in all probability the Hamorrhage wond be fatal if they were to be wounded —

The Dura Mater is inelastic; hence it will not give way to Matter when it is formed under it, in which case it is necessary to puncture it to discharge the Matter before it can affect the Brain, but this Puncture is by no means to be made wantonly, upon a slight Suspicion; as the exposure of ye. Dura Mater is attended with bad Consequences; besides, even a simple exposure of it alone in Trepanning sometimes is attended with violent

Inflam

inflammatory Symptoms, and there wond be much greater Danger in puncturing it — It was a long time supposed that the Dura mater had Motion in itself, hence it was thought to be mus=cular; but when it was proved that it had no muscular Fibres, it was then said that the Pulsation was caused by the arteries upon its Surface; but it has no motion at all of itself, and when a portion of ye. Skull is removed from it, the motion which is observed in the Dura matin at that Place is caused by ye. motion of ye. Brain — It has 2 arteries and the Impressions they make upon the inter nal Surface of ye. Cranium shew how exactly the Cranium is filled up in every part by the Encephalon —

The Pia Mater is a very fine thin membrane every where closely adhering to and covering the Brain; the exter=nal Surface is smooth & Even, with its Blood vessels appear=ing very visibly on it on account of its Fineness — It has external & internal Processes; the external are similar to those of ye. Dura mater allways accompanying each other and as they pass out at the great Foramen they adhere together; the internal Processes insinuate themselves between all the Convolutions of the Brain forming a no. of Septa, Plica &c. in the Cerebrum & Cerebellum —

We know but little or nothing of ye. Structure of the Brain; it is supposed to be a Gland by some — It is exter=

-nally

externally of a brown Cinerituous Colour, internally white; the brown part is called the Cortical, & the White the medullary Part, which is much less vascular than the cortical. The cortical part is looked upon to be the Secretory part and the medullary parts are supposed to receive the Secreted Fluid called the animal Spirits which is conveyd from thence to every part of the Body by the Nerves w.ch are looked to be the excretory Ducts —

all Animals are supposed to have a greater or less degree of Sagacity in proportion to the Size of their Brain, but I believe there is little in it; the Human Brain is the largest of all Animals, and weighs about 2 Pounds in an adult —

Of the Structure of y.e Brain with the Method of Dissecting it —

The Cranium being Sawed thro all round near it's Basis just above the Orbits of y.e Eyes & upper extremities of the Ears and taken away, the Dura Mater is then to be carefully raised from the Pia mater with the falciform Process, and the two Hemispheres covered with the Pia Mater is laid bare —

Seperate the 2 Hemispheres a little asunder with the Fingers, and we get a view of a little white appearance called the Corpus callosum.

A very large Portion of the Cerebrum, almost the whole of it, is carefully to be removed with a very sharpe Knife, when we see the cortical Part every where external & the medullary Part internal & putting on an Oval appearance, hence called the Centrum Ovale; we have now a better and plain View of the Corpus callosum, thro the middle of which runs a longitudinal Eminence called the Raphe; on each side of this Raphe are situated the lateral Ventricles —

The next thing to be done is to open the Ventricles by making an Incision on each side the Raphe thro the Corpus callos. and carefully removing a part of y. medulla about it on each side; we have then a view of these canals running from the anterior part of the Brain & passing beyond the Middle Lobes to the Posterior ones they take a winding turn downwards & forwards & terminate in the third Ventricle —

In these Cavities there is allways a small quantity of watery Fluid; and when this Fluid is accumulated in too large a Quantity, the Disease is called a Hydrocephalus, for which we ought never to open the Tumour in order to discharge the Water for the Patient generally dies in a short time after the Operation —

Immediately under the Raphe, is a white medul=

Cary

medullary Substance appearing when the Raphe is gently drawn upwards, called the Septum lucidum.

We now make a longitudinal Incision along the middle of ye. Raphe & thro the Septum lucidum and carefully throw aside the part on each side, when we get a view of ye. Fornix, which is a white medul= lary Body following the Course of ye. Ventricles beginning anteriorly in one Body and running a little way pos= ~~teriorly~~ they ~~divide in~~ divide into 2 Crura called Crura Fornicis, on each side of which is seen a portion of ye. red vascular Substance called the Plexus Choroides, and at the anterior Part of the Fornix are situated 4 Eminences, two small ones which are most anterior & called Corpora Striata and two larger & more Posterior called the Thalami nervorum opticorum.

Cut thro the Body of the Fornix and turn one part forwards & the other backwards, and we then get a more perfect View of ye. Plexus choroides and the Thalami nervor. opt.; on each side the Plexus choroides and between the Thalami are one or two large Veins called Vena magna Galeni which come from the Plexus choroides and uniting form a large Vein, which

which terminates and empties its Blood into the 4th Ventricle of ye Brain called the Torcular Herophili. The Plexus choroides serves as a kind of Pia mater to the Ventricles whose course it follows every where and is nothing but a fine membrane composed of Blood Vessels, all of which empty their Blood into the Torcular Herophili —

Remove the Plexus choroides & we then have a more perfect view of ye Thalami between which is situated the 3d Ventricle which we may see by seperating the two Thalami a little: here we have also two small Foramina, one anterior leading from the Thalami to the Infundibulum and called the Tuba or Iter ad Infundibul.; the other posteriorly going into the aqueduct called Anus; these 2 Foramina communicate with each other between the Thalami. The Iter ad Infundib. ~~goes~~ leads immediately down to the Glandula Pituitaria, and when a Probe is thrust down thro it the end of the Probe rests immediately upon the Gland which is situated upon the Sella Turcica — The Infundibulum is that Part where the Ventricles all terminate in the middle Lobes of ye Brain — Between the Thalami posteriorly we

have

have situated the small red Body called the Glandula Pinealis which is covered by the Pia mater & is attach'd to the Thalami — This was supposed by Descartes to be the Seat of the Soul because the Cerebrum & Cerebellum met here first — Behind the Infundibul. lies the 4th. Ventricle which communicates with the 3d. by the Aqueduct of Fallopius, and has a process called Calamus Scriptorius; but this cannot be shewn till the Brain is taken out of the Cranium, and we must therefore now proceed to the Cerebellum: to get a view of which, we must carry off all the Posterior Lobe of ye. Cerebrum carefully, and when this is done we have a view of it covered by the Dura mater and divided by the 4th. Process of ye. Dura mater into 2 Lobes; we likewise see the Plexus choroides going to terminate in the Fornicar Perforatis. On removing the transverse processes of the Cerebellum it then appears covered with the Pia mater — On making an horizontal Section thro its Substance we find the external the Cortical Part, & the Internal the Medullary; but the Medullary part puts on a different form from that of the Cerebrum, ramifying like the Branches of a Tree

Tree & hence called Arbor Vitæ.

We now return to the Brain & shew 4 Eminences situated behind ~~quadra~~ the Thalami and immediately under the Pineal Gland called Tubercul: Quadrigemin. or Nates & Testes.

Underneath these Tubercles runs the Aqueduct of Fallopius leading from the 3d. to the 4th. Ventricle. The 4th. Ventricle is shewn by removing a Portion of the Cerebellum situated on the Back part of ye. medulla oblongata, and by introducing a Blow-pipe between the 2 Thalami into the 3d. Ventricle & blowing air into it we blow up the 4th. by ye. air running thro the aqueduct Fallopii into it. Thus then we see the Communication between the 4 Ventricles; the 2 Lateral terminating in the 3d. & the 3d. with the 4th. as above.

The Brain is now to be taken out of ye. Portion of ye. Skull that contains it; in doing of which we are to shew the different Pair of Nerves that belong to the Head. Of these there are 10 Pair; all of which

which at their first origin appear very loosely connected together by the Pia mater only and after Piercing thro' the Dura Mater they are closely surrounded by that Membrane and appear to be white Shining cords — The 1st. Pair we have a Sight of after raising the anterior Lobes of the Cerebrum a little out of y. Basis of y. Cranium are the Olfactory which are very small and pass out near the Crista Galli — The 2d. Pair are the Optic, which are very large and arise single ~~[illegible]~~ at first from the Thalami nervor. optic. but unite at the Sella Turcica and again soon divide, and pass out thro the Foramina in the Os Sphenoides & go one to each Eye — Behind these we see the 2 Carotides going into the Brain; the Gland. Pituitaria and the Infundibulum — We come next to the 3d. Pair which arise from the anterior Part of y. Tuberculum annulare and are distributed about the Globe & Muscles of y. Eyes — Behind these are the 4th. Pair which are the smallest of any, arise nearly in the same place as the 3. and are distributed about the Eyes — The 5th are a

large

large Pair which arise from the Tuberculum annulare laterally and are distributed upon the Forehead &c — Behind the 5th. are a Smaller Pair the 6th. which arise from the Corpora Pyramidalia and are distributed about the Face chiefly — The 7th. are the auditory, which are Small and are distributed in two Branches each about the Ears; one Branch is the Portio mollis which is supposed to receive no Covering from the Dura Mater and is distributed about the internal parts of ye. Ear; and the other Brch. the Portio dura is spent upon the external parts & part adjacent — Next to these we have the 8th. which arise from the 2 Eminences called Olivaria and joining the Nerve called Accessor. Willisii and are distributed about the Neck, Some Muscles of ye. arm, Larynx, Face &c — The 9th. go out just at the Verge of ye. great Foramen and are distributed upon the Tongue & Muscles of ye. Os Hyoides &c. — The 10th. we cannot now shew as they pass out between the 1st. & 2

Vertebra

Vertebra of ye. Neck upon the muscles of which and other Parts adjacent —

And Obstruction in any of these Nerves will cause a Paralysis or Loss of motion or Sensation in whatever parts they are sent to, unless they receive Branches from other nerves, and if they do, the Action of such Parts will nevertheless be much impaired from this obstruction of ye. Principal Nerve — Thus an Obstruction in the first Pair may occasion a Loss of ye. Sense of Smelling; in the Optic, a Loss of Sight, which is called a Gutta Serena when the Eye does not alter its appearance at all but yet has no Sight —; in the 7th. Pair an obstruction produces an Incurable Deafness —

The Brain is now taken out, and the Basis turned upwards; this appears very irregular, having 4 Eminences; the 2 anterr. which are the posterior Lobes of ye. Cerebrum, are called Olivaria; and the 2 posterior are the inferior part of ye. 2 Lobes of ye. Cerebellum and are called the Corpora Pyramidalia: in the middle between these

4

4 Eminences is situated another Eminence called Tuberculum annulare from which the Medulla Oblongata is continued thro the great Foramen — In some Brains the Tunica Arachnoides may be now shewn on the posterior part of ye. Medulla Oblong.t between the Dura & Pia mater —

Upon the Medulla Oblongata are observed several Eminences, and on the Posterior part of it is seen the Process of ye. 4th. Ventricle called the Calamus Scriptorius.

Of the Thoracic Viscera. 90

The Thorax is bounded anteriorly partly by Bone & partly by Cartilage, posteriorly and laterally by Bones, Ligaments, Muscles &c. Its Contents are, the Aorta & Oesophagus, which run behind the Pleura, the Lungs, and the Heart with the Pericardium, which are contained within the Pleura. The Cavity of the Thorax is lined internally by the Pleura which is a reflected Membrane giving a Coat to the Lungs &c.; its external Surface is rough & uneven, owing to the Cellular Membrane adhering to it; its internal Surface is smooth & even and is lubricated by a watery Fluid called Liquor Pleuræ: it differs from the Peritonæum in one Respect, that forming only one Bag for the abdominal Viscera, whereas the Pleura forms two, one for each Lobe of the Lungs. These two Bags come nearly in Contact anteriorly in the Middle between each Lobe of ye Lungs under the middle of the Sternum; their two Sides here are only seperated by a small quantity of Cellular Membrane and this Duplicature of ye Pleura is called Mediastinum, which is attached to the middle of the first & second Bone of the Sternum, but when it gets to the 3d or last Bone it turns a little to the left; hence ye right side is larger than the left – but this is various in different Subjects – The quantity of Cellular

membr.

Membrane between this Duplicature is very small, tho' we find some authors describing it as keeping the 2 Folds or Sides of y^d. Bags at a considerable Distance from each other; this is occasioned by lifting up the Sternum to shew this Part, but if we replace that Bone in its proper place it is evident that the Sides of y^d. Mediastinum is nearly in Contact, but when the Sternum is raised they seperate wider — at the anterior & superior Part of y^d. mediastinum is placed the Thymus Gland — The Sides of these two Bags approach each other behind at the Spine in the same manner as they do anteriorly, which some have distinguish'd by the name of Mediastin. poster., but it is only a continuation of y^d. Duplicature — The Pleura is reflected over the Lungs from the Place where the Pulmonary Vessels enter, and gives an external covering to them: we sometimes meet with adhesions of y^d. Pleura which lines the Cavity & that which covers the Lungs, which are unattended with any bad Symptoms during Life —

We are told by Surgeons that abcesses form sometimes between the two Lamina of the Mediastinum; to remedy which, they advise making a Perforation thro the Sternum with a Trepine to evacuate the matter. The Symptoms attending these abcesses are, Pain and Difficulty of Breathing, Syncope &c., and sometimes there is an external Tumour attended with a Pulsatory

Motion

Motion, and hence is mistaken for an aneurism of the aorta. A Case of this Kind lately happened in Guy's Hosp.^l, in which, the Surgeons observing the Pulsation which the Tumour had, expected when it burst that the man wou^d immediately die; but to their Surprize it burst and discharged a large Quantity of Pus and the Patient did well. Here if the Case had been suspected, the application of the Trepan in Time wou^d have been of Service: and there is not the Danger of applying this Instrument upon the Sternum in these Cases as some imagine; for tho' the Mediastinum in a sound State is nearly in Contact, yet when Matter is collected in great Quantities between the Duplicature of it, they are seperated by it so far that there will be no danger of opening either the right or left side of the Cavity of ye Thorax, which we shou^d be very careful to avoid allways; for if the Pleura is wounded on both sides of ye Mediastinum, ye Air rushing into both Cavities wou^d occasion a Suffocation — if only one side however of ye Cavity is opend, the Air getting into it, wou^d not produce Suffocation, as the other Lobe of the Lungs wou^d not be interrupted in performing its Office by this accid^t. The Mediastinum serves to keep one Lobe of the Lungs from prefsing upon the other whenever we lie down upon side, and also to cut off all Communication between them,

that

that one may act without Interruption when the other is diseased: and we have frequent Instances of Patients who have lived Consumptive for several months, when one of the Lobes have been found after Death entirely destroyd: such however have allways a Difficulty of Breathing &c. In Empyemas the Lungs are often eroded, and sometimes one Lobe entirely destroyed, yet the Patient lives some Time after it — A Man not long since at Guy's Hosp.l had the Operation for the Empyema performed & several Quarts discharged and the whole Lobe on one Side in an ulcerated State, yet he lived several months after it; and on Dissection after Death, only a Schirrous Knot was found in that Side of y.e Cavity and no air Tubes or Vessels were observed to be sent to it — There are some who deny this Doctrine however —

The Thymus has a vascular appearance in adults and is small; in y.e Fœtus and young Subjects it is large and appears a perfect Gland: it often extends under the Sternum and into the neck above the Clavicles. no excretory Duct has yet been found belonging to it, tho' it is said that it secretes a Fluid which is deposited in the Thoracic Duct for the nourishment of y.e Fœtus; but how it can get there is not clear — as it is so small in

adults

adults to what it is in the Fœtus it may perhaps serve some Particular purpose to the Fœtus which is no longer necessary after Birth and therefore it gradually decreases as age advances, and in some there is hardly any vest=
=tage of it left — I have seen it very large in a Criminal whom I dissected at Surgeons Hall —

The Liquor Pleuræ serves to moisten the internal Surface of y^e Pleura and external Surface of the Lungs, preventing adhesions of them &c.; some say it is deposited by Glands, and others by Vessels, which last is certainly the Case, as no Glands can be demonstrated here. When this Fluid is accumulated in too large Quantities it is called a Dropsy of the Breast: if it is in too small quantity it may be the Cause of Adhesions —

The Thyroid Gland is situated upon the upper part of the Trachea rather below the Thyroid Cartilage once upon the Cricoid, but it is connected to the Thyroid Cartilage from whence it hangs down upon the Cricoid. It is called a Gland tho no excretory Duct can be found, nor do we know that any Secretion is carried on by it, and it's use is equally unknown — It is the Seat of the Bronchocele which is an Enlargement of this Substance — It has a considerable Blood Vessels to it, hence we might conjecture it

might

must serve some particular use which we are unac=
=quainted with at present — In the adult there is ob=
=served a considerable Depression or Fissure in the middle
of this Gland —

On the anterior part of the Neck we see the Larynx
projecting forwards, from which is continued the Trachea
or air Tube, which is in part muscular & in part Car=
=tilaginous — Behind the Trachea lies the Oesophagus
or alimentary Canal, which is a muscular Bag;
from this Situation of the Oesophagus it is evident
it can hardly ever be injured in any attempts of
People who cut their Throats, or without dividing the
external Carotids &c

The Pericardium is a membranous Bag containing
the Heart within it, and hence its Name — Some
anatomists describe it as having 3 Coats, others 4; but
properly it is composed of two only, the membranous &
Tendinous; the Membranous is only a Continuation
of the Pleura over it; the 2d Coat y. tendinous adheres
to the Diaphragm, and hence it obeys its Motion: there=
fore we are told that in very deep Inspirations this
Tunic is compressed by the Diaphragm against the right
auricle & Ventricle and by that means puts a Stop to the

Circulation

Circulation for a Second or two; this will be found to be true; for if we make a deep Inspiration and hold our Breath for some time after as long as we can, and at the same time keep a Finger upon the Pulse at the Wrist we may observe the Pulsation to flagg or totally stop for a short time — The 3d. Coat as described by some is the internal Surface of yd. Last which is reflected ~~from~~ the great Vessels going from the Heart from the Place where the Pericardium adheres to them, and over the external Surface of the Heart — Within the Pericardium is lodged a Liquor which lubricates the external Surface of the Heart & prevents its adhering to the Pericardium. The quantity of this Fluid is different in diffr. Subjects; in some near a Pint has been found & the Parts not at all diseased, in others very little — Some say, the longer it is before the Body is dissected after Death the greater will the quantity be, and vice versa — But this is only conjecture as I have found the reverse turn out: it is sometimes of a reddish Colour, which is owing to a Transudation of Blood from some of yd. Small Vessels of yd. Heart after Death & mixing with it gives it this Colour — It is deposited by Vessels —

Of the Lungs —

The Organs of Respiration are divided into active & passive: the Lungs are the Passive & the Diaphragm Intercostal Muscles &c are the active.

The Lungs are divided by the Mediastinum into 2 Lobes, the right & left: the Figure of them have been compared by some to the Hoofs of a Cow's Foot; they are convex Superiorly, posteriorly & laterally, and concave inferiorly —

In a deep Inspiration the Heart with its Pericardium is almost entirely covered by the Lungs, but in Expiration they recede from each other & leave the anterior part of the Pericardium bare — Whether in Expiration or Inspiration the Lungs with the Heart & their Membranes entirely fill up the Cavity of the Thorax & the Lungs are allways in Contact with the inner Surface of y. Pleura; hence it is scarcely possible for the Lungs to remain unhurt in Wounds penetrating the Cavity, and Wounds of them are easily discovered by the Discharge of frothy Blood both from the Wound and Mouth; and if the wound is deep it will be attended with violent Symptoms of Inflammation &c which generally prove fatal; tho' Slight wounds of the Lungs have done well ——

The outer Surface of the Lungs in Infants appears to be of a granulated Substance like a conglomerate Gland, but in adults this appearance does not exist; they are of a redder Colour in the Fœtus than in adults in whom they put on a greyish appearance —

The Lungs have 2 Coats; the external is a Continuation of the Pleura reflected over their external Surface and is connected to the 2d. by a Body of Cellular membrane in the Fœtus, but in adults it is very difficult to seperate the one from the other. The 2d. Coat adheres firmly to the Vascular Substance and sends off Continuations which are insinuated thro the Substance of the Lungs & covering the air Cells. The Lungs are composed of Blood Vessels & air Vessels — The air Vessels are derived originally from the air Tube the Trachea, which ramifies thro their Substance and forms an infinite number of Cells which communicate one with the other — This Tube arises in one Trunk & takes different names in different Parts before it gets to the Lungs; its upper part is called the Larynx which is covered by the Glottis to prevent any Alim.t getting into it in

Deglutition

Deglutition; then running down on the Forepart of the Neck it is called Trachea till it gets into the Cavity of the Thorax, where it divides into 2 Branches, one going to the right, the other to the left Lobe of the Lungs; at it's Bifurcation it is called Bronchia which name it retains thro the whole Substance of the Lungs. The Trachea is covered externally only by the common Integuments; it is round anteriorly & flattend Posteriorly where it lies in Contact with the Oesophagus, and is in part Cartilaginous, in part muscular, membranous & glandular: anteriorly it is composed of a number of Cartilaginous Rings which are connected together by an intervening Ligamentous Substance which is yielding & elastic and gives way in Expiration & Inspiration to the shortening & lengthening of the Trachea. Posteriorly it is muscular & membranous and is flattened to make room for the Passage of the aliment thro the Oesophagus which it would have impeded had it been round as it is anteriorly, and besides if that had been the Case it might have also obstructed Respiration in the Passage of the aliment thro the Oesophagus. Hence its advantages in being partly Cartilaginous and partly muscular & membranous. On

the

the posterior flat part there are a No. of small Eminences which are called Glands and are most numerous where the Trachea divides into Bronchia; they secrete a Mucus to lubricate & keep moist the internal surface of the Trachea which is lined by a fine thin Vascular membrane which is endued in every part with the most exquisite Sense, as we often find, if only a drop of water in Drinking passes over the Glottis into the Trachea, so that it seems to be adapted for the Reception of Air alone;- it is supposed to derive this Sensibility from a No. nervous Fibrilla spent upon it. From the continual Passage of the air thro this Tube the membrane which lines its internal Surface would soon grow dry if it was not for the Mucus which these Glands Secrete; this mucus sometimes becomes hardened & inspissated by Heat in Colds, Coughs &c. & is the Cause of great uneasiness till it is spit up:- this frequently happens in a morning when we have fallen asleep with our mouths open, we awake & find a disagreeable uneasy Sensation in the Throat from the Dryness of the Parts & thickening of the mucus, which as soon as the mucus is coughed up goes off -

Wounds of the Trachea if properly managed are not

dangerous

dangerous. I would by no means recommend the wound of ye Trachea to be sewed up, but the Head should be brought forwards & kept in that Position which will bring the disunited parts into contact and if they are not disturbed will soon heal if at the same time the wound is dressed quite superficially: if the wound in the Integuments is very large a Stitch or two may be made in that to hasten the reunion of the Lips of the wound — When the Trachea is wounded & the wound in the Integum^ts is at the same time very small as may happen from Stabs with a sharp pointed Knife or Sword, an Emphysema may follow which is occasioned by the air coming from the Lungs in Expiration not having a free Exit thro the external wound, insinuating itself into the Cellular membrane in the same manner as ~~when~~ we see Ecchymoses follow Bleeding when the Orifice is made too small when the Blood gets into the Cellular membrane & causes that Lividness from its not having a free Exit from the Vein; whereas had the wound been large enough in the one or the orifice in the other neither ~~of~~ an Emphysema or Ecchymosis would have followed, when the air or Blood had a free Exit. In this Emphysema there will be no necessity to dilate the wound of ye Integuments, but it may treated as ~~the~~ Em-

physema

* Would it not be advisable to take the bark & other antiseptics internally? —

Emphysema arising from an Injury done to the Lungs by making Punctures into the Cellular Memb.e in diff.t Parts & using Compresses &c — I once saw a Child who from a violent fit of Coughing in the Hooping Cough ruptured the Trachea which was followed by an Emphysema in the Neck —

Dr. Huxham relates the Case of a Patient who had a general Emphysema without any previous accident happening to injure the Lungs or air-Tube; but this man had an universal Scurvy which had vitiated the Fluids and rendered them so acrimonious as to erode the Cellular membrane of the Lungs and the other Parts of the Body, and the air escaping from the Lungs got into the Cellular membrane the nearest situated to them & by degrees became general — In Mortifications we frequently see the Gangrened Parts become Emphysematous which is caused by the Putrefaction generating air in those Parts; when it shews itself above the Gangrened Part it denotes the Mortification is increasing — In all these Cases I would recommend a tight a Bandage after the confined air was pressed out as the Patient could bear with Compresses dipt in Spts. to prevent the farther putrefaction & compress the Memb. Cell. *

* The

The Bronchia after they enter the Lungs ramify thro their Substance & terminate in air Bladder with oval or spherical Points all over the Surface of the Lungs which are very evident & appear exceedingly numerous when filled with Quicksilver; according to the general opinion at present these Cells have free Lateral Communications with each other — Upon the Bronches of the Bronchia and around the large Blood-Vessels of the Lungs are situated little Bodies of a reddish Colour in y. Fœtus but bluish Colour in Adults which are most numerous about the Bronchia just before they enter the Lungs and are called Bronchial Glands — Winslow thinks they are mucous Glands, but they appear to be rather Lymphatic as no excretory Ducts can be discoverd belonging to them — Some are of Opinion that the darkish Coloured mucus we sometimes Spit up of a morning is secreted by these Glands but it is only Conjecture — We hear of People who have lived several years after they were supposed to have expectorated part of their Lungs and even the Pulmonary Artery with it, but common Sense will tell us that it is absurd to believe such a Report and that it is nothing but this mucus Inspissated

and

and brought away in Knots of various sizes & colours —

The Blood Vessels of the Lungs are two arteries one to each Lobe, & according to some 2 veins coming from each Lobe — The Pulmonary artery is rather thinner in proportion than the aorta & other arteries; and the veins are less capacious than the arteries which is contrary to the general Rule of Nature in other Parts of the Body: the Reason of this is said to be that by the smallness of the veins the Blood is not so easily thrown out of the arteries into the veins and by that means it is kept longer in the Lungs for them to have more time to produce that change upon the Blood which it is said to con= =vey in them — But besides these Vessels, the Lungs have a small artery & vein called the Bronchial or Ruyschian which runs along the Trachea & Bron= chia & their Branches conveying Blood purely for their Nourishment and for the secretion of ye. mucus in the Trachea —

All the Vessels, both air & Blood Vessels enter the Lungs at one Place and this is called the Root of the Lungs where they are connected & surrounded by a Body of fillical or membrane which is continued

thro

thro the whole Substance of the Lungs - The Cells of this membrane here are not distended to any considerable Degree in Emphysemas & Gangrena as in other parts of y^e. Body, without producing Suffocation - It has been asserted that the Cellular membrane which surrounded the Vessels of y^e. Lungs was much distended in the Disease which lately raged among the horned Cattle -

It has been a dispute among many whether any air was contained in the Cavity of the Thorax between the inner Surface of the Pleura & external one of the Lungs; but it is absurd to imagine that there is -

The Lungs after they have inflated with air will float in Water, but in the Fœtal State before Birth when no air has ever entered them, they will sink like a piece of Liver, Spleen &c. because they are compact & in a Collapsed State like them, but as soon as the Child is born, the Lungs become distended by the Childs Breathing & the air Cells which were before collapsed become now filled with air which it is a hard matter to press out afterwards so as to prevent there being a sufficient quantity still left to cause them to swim when put into Water -

From this observation it customary upon Trials of

Women

Women who have been suspected of murdering their Children to have recourse to this Experiment of throwing the Lungs into water as the best Criterion to judge whether the Child was born dead or alive and Surgeons are sometimes called in to give their opinion; if the Lungs swim in the water, it is concluded that the Person is guilty, if they sink on the other hand it is concluded that the Child was born dead & the accused Person is acquitted — But like all other general Rules it is liable to exceptions and is by no means an infallible one; for the Child may have been dead so long before the Lungs are examined that they shall have become putrid, in which case the air which is generated in them by Putrefaction will be sufficient to cause them to swim in water tho' the Child never breathed; and another circum=stance is that Children are often delivered, who shall just breath and immediately die, but as the Lungs have been inflated by that means it is suf=ficient to cause the Lungs to swim — For these Reasons when a Surgeon is called upon for his opinion in such a case he shond weigh well every Circumst.ce relative to the appearance not only of the Lungs but of every other part of the Body as the Life &

Reputation

Reputation of ye. Parent is at Stake, and for this Reason he ought to be very tender in delivering his Sentiments upon it and not condemn the unfortunate & perhaps innocent Mother, but offer these Circumstances to the Consideration of the Court; for tho' the Swimming of the Lungs when they are in a sound State may be a proof of Guilt, yet it is not sufficient without some other corroborating Proofs to convict a Person — Indeed this Experiment is not conclusive on either side of the Question; for the Lungs may happen to sink in Water yet the Child be born alive: but we ought to be on the most favourable side of the Question for our own peace of mind & therefore when this shoud turn out, shoud certainly judge according to the rec.d opinion, that the ~~Lungs~~ Child was still-born, rather than appear too severe & prepare for the mothers Conviction — For Instance, the Child is born alive, but from some Cause or other an Inflammation comes on the Lungs immediately after Birth, which will cause such an adhesion of the air Cells and other Parts of ye. Lungs as to kill the Child in a few minutes: in this Case they will appear as if they never had been inflated and if put into Water will sink:

And

and it is said that a child may be born alive & breathe a few minutes and suddenly dying, the lungs will appear collapsed as if no air had ever been in the air Cells and will sink in Water; & this may happen without any Inflammation ~~preceding~~ - Here are two Objections, in which the Child was born alive & yet the Lungs sink in Water - It is necessary we should be well acquainted with all these circumstances, tho we would not willingly mention them in a Court of Judicat.^d unless we were first called upon to answer the Question whether it was possible to happen or not -

The use of these organs we are perfectly unacquainted with further than that they are the Grand organs of Respiration - But it is supposed that the Blood is sent thro them to undergo some change that it may be rendered more perfect & nutritious, but in what manner it is effected or whether it does undergo any change at all is not known - It is supposed to be cooled as it passes thro the Lungs by being fanned by the air in Respiration, for the circulation thro the Pulmonary arteries is very rapid it has been calculated that the whole mass of Blood

passes

passes thro the Lungs 43 times in an Hour — many Hypothesis have been started to prove that the Air enters thro the Vessels & mixes with the Blood; or that the air Vessels communicate with the Blood-Vessels: but it cannot be proved that they do communicate, by the most subtle Injections —

Of the Heart

The Heart is one of the most curious and important Organs in the whole Body and is in continual Action from the first to the last Moment of a Man's Life, receiving & distributing Blood to all parts of the Body — It is a hollow Muscle and is the only muscle in the Body that is covered by a Membranous Coat — its Situation is obliquely across the Spine with its Basis or broad Extremity turned towards the right and its apex or small Extremity to the left Side — It is divided into its Basis, Body, Apex Surfaces & Edges; the Basis or Broad Extremity is formed by the auricles & upper part of the Ventricles; its Body is formed by the Ventricles which running to a blunt Point form its apex; its Edges are

turned

turned to the right & left side of the Thorax; and the Surfaces are the Posterior which is flat & end & the Anterior which is convex, it's Figure somewhat resembling a half of a Cone made by a longitudinal Section — It's external Surface is covered by a fine smooth Coat which is a reflection of the inner membrane of the Pericardium over it.

It is composed of 4 Hollow Bags or Cavities, which are the 2 auricles & 2 Ventricles:— the auricles have a free Communication with the Ventricles, the right auricle with the right Ventricle, & the left auricle with the left Ventricle; the Ventricles are much the strongest of these Cavities, and round their upper Part runs a Notch or Depression which divides them from the auricles & in which lie the Coronary Vessels. All the Veins in the Body terminate in the 2 auricles and the arteries are continued from the Ventricles; the 2 Vena Cava empty their Blood into the right auricle and the Pulmonary Veins bring their Blood into the left; the Pulmonary artery goes off from the right Ventricle and the Aorta from the left —

The right auricle is much larger than the left,

as

as it receives the Blood from all Parts of the Body except the Lungs, and the left only receives the Blood from the Lungs: it terminates in a blind Point which was formerly called the auricle & the Body of ye. auricle called the Sinus of the Vena Cava; but the first is now only called its appendix & the other the auricle – The 2 Cavas enter into this Bag each of them obliquely by which means the 2 Columns of Blood are more readily drove on towards the Heart – The auricle is covered externally by the Reflection of the Pericardium which covers the Heart; and appears externally smooth & even, but internally it is rough and irregularly fascicular having a number of little Bundles of fleshy Fibres which are very strong; and between these Fasciculi the auricle is membranous only –

Just at the entrance of the inferior Cava into the auricle is situated a small Semilunar Valve called Valvula Eustachii, which is more distinct in the Fœtus than the adult, and is supposed to be to direct the Blood into the Foramen Ovale –

Between the Entrance of the 2 Cavas there is an Eminence called Tuberculum Lowerii which is

more

more considerable in Brutes than in the Human Heart: it is said to direct the 2 Streams of Blood in the Cavas entering and meeting each other fully & to turn it more into the Body of y^d. auricle; but it is too inconsiderable in the human Heart to answ^r. any great purpose —

In the Fœtal Heart there is a hole or Perforation in the Septum which divides the 2 auricles from each other; by which means a Communication is formed between the 2 auricles, so that the Blood passes in the fœtus in utero from one auricle into the other without going thro the right Ventricle & into the Lungs — This Perforation is called Foramen ovale, which closes up after Birth when the Circulation is carried on as in the adult; and leaves a Dent or Depression of an oval Figure: in some adults it remains pervious — In the Fœtus there is also a Communication between the Aorta & Pulmonary Artery by a Canal running from the one to the other called Ductus Arteriosus, thro which a small quantity of Blood passes into & circulates thro the Lungs & is returned by the pulmonary Veins — Thus the Circulation in the Fœtus is carried on in this

manner

manner; the Blood is brought by the Cavas into the right auricle, from the right auricle it is carried into the left thro the Foramen ovale, from the left auricle it is thrown into the left Ventricle, from whence it is thrown into the Aorta and by that distributed to all parts of the Body; but a small quantity as before observed passes from the Aorta thro the Ductus arteriosus into the Lungs & circulates thro them &c. The Ductus arteriosus as well as the Foramen ovale closes up after Birth as there is then no further occasion for them; but sometimes they both remain patenions in adults; and when it is the Case, it is said that the Circulation may be carried on without the assistance of Respiration, and the Person will live some time without Breathing as in the Fœtus, by the Circulation being performed in the same manner, as in the fœtal State —

Just at the Entrance of the inferior Cava into the auricle between it & the Ventricle is situated the mouth of the Coronary Vein which has a small Semilunar Valve at its entrance into the auricle to prevent the Regurgitation of Blood into it —

The use of the right auricle is to receive the Blood of the 2 Cavas & to force it onwards into the Right

Ventricle

Ventricle: when the Blood is emptied into the auricle it occasions a Stimulus and the auricles contracting throws the Blood into the Ventricle; but there is also at the same time a Regurgitation of Blood into the 2 Cavas which causes them to become distended till the Ventricle becomes empty to receive more Blood from the auricle, when the veins again recede, ~~and the Ventricle~~ by this means a Pulsatory motion is observed in these Veins. vid. Lect.d on the Structure of the Veins. p. — 8.

The right Ventricle is externally smooth & even unless loaded with Fat: internally it has a no. of fleshy fasciculated Fibres called Cordæ Columnæ running from one Side of y.e Ventricle to the other; and besides these, there is an order of tendinous Fibres running across the Ventricles called Cordæ tendineæ. The Cordæ columnæ by contracting propell the Blood forwards into the arteries; and the Cordæ tendineæ being inelastic strengthen the Ventricle & prevent the too great Dilatation or Distension of it: and some of them seem to serve as Tendons to the Cordæ columnæ —

The Ventricles have two orifices, the one called its auricular & the other the Ventricular orifice, at each of which are placed Valves; those at the auricular

Orifice

orifice are called Triuspides, tho they are not properly 3 distinct Valves but only a fine membrane hanging loosely down from which are going off several Cords tendinea which at the Time the Ventricle contracts to throw the Blood thro' the expelling orifice into the artery, draws the Sides of these Valves nearly together and prevents the return of the Blood into the auricle, but when the auricle contracts & throws the Blood into the Ventricle they are pressed down by the column of Blood against the Sides of the Ventri=
=cle, so that they are no impediment to the Bloods Passage from the auricle into the Ventricle, tho' they prevent its regurgitating back into the auri=
=cle — At the upper part of ye. Ventricle is the arterial orifice from whence goes off the Pulmo=
nary Artery; at this Place we have 3 distinct Valves situated just at the beginning of the ar=
=tery and from their Semilunar Form are called Valvulæ Semilunares — They are so situated that when the Blood is thrown out of the Ventricle into the artery they will be pressed down close to the Sides of the artery & suffer the Blood to pass freely on, but when it attempts to return back, they are forced

up

up & project across the Cavity so as entirely to stop up the Passage & by that means prevents the Return of the Blood into the Ventricle at the time the Artery contracts to propell the Blood forwards –

The left Auricle is smaller than the right as has been before mentioned. Into this the Pulmonary Veins empty their Blood, whose entrance differs in almost every Subject; they often enter by two different Branches from each Lobe of the Lungs on each side of the Auricle, but this is not allways the case – This Auricle has the same appearce externally as the right and has the same fasciculated appearance internally, but they are not so strong as in the other; it is thicker than the right: there are no Valves in the Pulmonary Veins and there seems no necessity for any, tho some assert there are – The left auricle is in every other respect similar to the right except in the appendix which terminates in a sharp point –

The ~~right~~ Ventricle is thick, strong & muscular rather stronger than the right: in it are observed the Carneae Columnae and Cordae Tendineae the same as

as in the right which have the same use, and it has the auricular & arterial or Ventricular orifice – In the left Auricle are observed often bloody Concretions called Polypi lying loose in it – The Remains of ye. Foramen Ovale is to be seen on this side of ye. Septum as in the right —
Between the auricle & Ventricle is placed the same kind of membrane which forms the Valvula Tricuspides in the right Ventricle, but here it is divided into two Portions only and from its resemblence to a mitre are called Valvulæ mitrales. Their use is similar to that of the Tricuspides.
The Valvulæ Semilunares of the Aorta are similar in their Situation, Shape & use to those of the Pulmonary artery – It is observed that not only here but in the Pulmonary artery, in the middle of these Valves, there are little eminences or additional Valves which serve to fill up the Passage of the arteries entirely, when the Blood attempts to regurgitate from the arteries, which it is easy to conceive the Valvulæ Semilunares alone could not do (as they are only Semilunar) with their convex sides only in contact which is the Case when they

use

6

rise up & project within the Cavity of the artery at which time they form a small Cavity or hole in the middle which is filled up by these little Eminences or additional Valves, which are called Corpora Sesamoidea —

The Structure of these Tricuspid Valves is entirely membranous and are said to be formed by a continuation & projection of ye. internal Coat of the arteries.

It is observed that the right Auricle is stronger & larger than the left, but the right Ventricle is not so strong as the left, because it sends ye. Blood into the Lungs only, which being near does not require so great force to propel the Blood into them as ~~the~~ is necessary to propel the Blood to all parts of the Body which the ~~right~~ left Ventricle does; and for the same Reason the aorta is stronger than the Pulmonary Artery —

The Vessels of the Heart are Arteries, Veins, Nerves & Lymphatics — The arteries & Veins are called the Coronary Vessels: the arteries are the first Branches the aorta gives off, one running to the left & the other to the right side of the Heart, called the right & left Coronary: they are sent to the Heart entirely

for

for it's Nourishment; they run in the notch which divides the auricles from the Ventricles and distribute Branches all over the Surface of the Heart which have freq.t anastomes with each other, and two considerable Branches meeting at the anterior part and uniting forms what is called the median Coronary Artery — The mouths of these arteries sometimes open into the Ventricle & when they do, the Blood is thrown into them by the Contraction of the Ventricle; but they more commonly arise from the Aorta just beyond the Valv. semilunar. and when this is the Case it is evident they must be filled with Blood when the artery Contracts to throw the Blood onwards, for the Valves are pressed down over their mouths by the Column of Blood coming from the Ventricle into the Aorta and by that means prevents their being filled by the Contraction of the Ventricle; but as soon the Aorta contracts, the Valves are raised up & leave the mouths of y.e arteries open, so that the Blood then passes into them —

There are a great number of Lymphatics running over the Surface of the Heart, which are

Sub=

supposed by some anatomists to empty their Lymph within the Pericardium — However this is, there is allways a qty. more or less of their Fluid deposited here, in order to lubricate & keep the Parts moist, that the motion of the Heart may be free & easy and to defend it from Injuries ~~from~~ it wou'd otherwise be liable to from Friction — The Veins of the Heart are commonly described as two and called right & left Coronary, but there is properly no right; the largest Branch of the Veins is placed within the notch on the left side of the Heart & may properly be called the left Coronary Vein — The Branches are distributed in various Directions over its Surface & frequently anastomose — The Nerves sent to the Heart are very minute & numerous which makes it the most irritable organ in the Body — On the inner Surface of the Auricles & Ventricles there are said to be a number of Foramina which some say are Arteries & Veins; but I believe this opinion is false — Some object to the Heart's being muscular because they cannot unravel its Texture, but the reason why they cannot

do

do that, is that the Fibres run in a great many different Directions; but whoever will boil the Heart of an Animal & make a transverse Section of it may see the muscular Fibres very distinctly running in so many various Directions that they cannot be seperated by the nicest & most careful Dissection –

It was long disputed whether the two Auricles acted together at the same time, and whether the Ventricles did the same; or whether they acted alternately: but since the immortal Harvey's Time it is generally allowed that the auricles contract at the same time and also the Ventricles do the same, and their Dilatation is called Diastole, their Contraction Systole: therefore when the auricles contract or are in their Systole, the Ventricles are both at the same time in their Diastole or State of Dilatation, and vice versa: and it seems reasonable to suppose this is the Case, or the Heart wond not be in Continual motion & the Circulation wond not be carried on regularly; for now when the right Auricle contracts to force the Blood into the right Ventricle, the left auricle

at

at the same moment of Time contracts to force the Blood into the left Ventricle, by which means both Ventricles are filled with Blood at the same Time and are in their Diastole; and when the right Ventricle contracts to force the Blood into the Pulmonary Artery, the left at the same Time contracts to throw the Blood out of it into the Aorta: thus the Circulation is carried on by the alternate Action of the Auricles & Ventricles, viz. Auricles being in their Systole while the Ventricles are in their Diastole & Vice Versa —

Wounds of the Heart are allways mortal; tho' we have heard of a Case some time since of a man at the Savoy who lived some time after receiving a wound in his Heart; and a man was lately carried into the London Hospital who had received a Wound which penetrated into the Heart, and he lived several Days after it — The Heart being Vascular is liable to all the Disorders that other Vascular Parts are, viz, Inflammation, Suppuration &c.: and we frequently hear of Abscesses forming in the Heart & evacuating themselves into the Pericard

Pericardium; these are allways mortal: there are some Instances of Ossifications in the Arteries near the Heart & in their Valves - vid. Philosph. Transactions No. 376 - We sometimes meet with aneurisms or Enlargements of ye Auricles & Ventricles with Coagulated Blood in them - The Death of his late Majesty was occasioned by a Rupture of one of the Ventricles -

We have observed that in the fœtal State the two Auricles communicate with each other by the Foramen Ovale, and the Pulmonary Artery communicates with the Aorta by Ductus arteriosus. by which Mechanism the Circulation is carried without the use & assistance of the Lungs, which have only a small qty. of Blood sent to them just sufficient for their Nourishment; for part of the Blood that is emptied into the right auricle passes into the left thro the Foramen ovale, whilst the rest passes into the right Ventricle but part of this likewise passes immediately into the aorta, when the Ventricle contracts, by the Duct. arteriosus., so that a very small portion circulates thro the Lungs by the Pulmonary

Artery

Artery: but immediately after Birth a wonderful change is brought about upon the Circulation; the Canalis arteriosus being supposed to close up immediately as also does the Foramen Ovale, by which means all the Blood of the right auricle is thrown into the Pulmonary artery & circulates thro the Lungs — The Foramen Ovale has sometimes however been found in adults not entirely closed, but there never was an Instance of the Ductus arteriosus being found open in adults —

On the Peritoneum & Abdominal Viscera

Having described the Viscera of the 2 smaller Cavities the Cranium & Thorax, it now remains to consider those of the largest of the three, the Abdomen; and in doing this I shall observe the same Rule as in the Description of the other two, by first pointing out its membranes — The abdominal Viscera are all covered & surrounded by the Membrane called Peritoneum which is reflected over the greatest part of them like the Pleura is over

the

The external Surface of the Peritoneum is rough on account of the Cellular memb.^e which adheres to it. It has the appearance of Ligaments upon it's Surface all of which terminate at the Navel, they are three below & one above it: that above the navel is the Ligam.^t ~~Suspensor~~ Rotundum of the Liver which is the remains of the Umbilical Vein of the Fœtus in Utero, which after Birth closes up & becomes a Ligament: the 2 lateral ones below the Navel are the remains of the Umbilical arteries of the Fœtus which likewise close up after Birth; and that in the middle is the Remains of the Urachus. The internal Surface is smooth & even. The Peritoneum lines the whole Cavity of the Abdomen forming one Compleat Bag, and is reflected over the Surfaces of the Liver, Spleen, Intestines &c., and adheres to the Spine posteriorly, where it forms a Duplicature which is continued from thence, with a q.^ty of Cellular membrane between the 2 Lamina, and runs over the outer Surface of the Intestines: all the Vessels likewise of the Intestines which pass to & from

from them run between this Duplicature which is called the Mesentery. Next to the Peritonæum immediately under it lies the Omentum or Epiploon floating loosely in the Cavity — The Viscera in the Cavity of the Abdomen are not properly contained within & surrounded by the Peritonæum, tho it is common to say that they are surrounded by it — I mention this Circumstance that you may be apprized of it, if ever the Question is proposed by men who are fond of Cavelling abt. such nice Points —

The Processes of the Peritonæum are only continuations of it over the different Viscera in the Cavity, as the Liver &c — and these are called internal Processes; there are some Anatomists who say that it has external Processes, and the Tunica Vaginalis is they say an external Process; but this is a Mistake, for we now do not ~~mistake~~ call that Tunic a Process of the Peritonæum ~~[illegible]~~, as, after it has descended into the Scrotum with the Testes, all Communication is entirely shut up between it

it and the Abdomen unless at the Time the Testes passes into the Scrotum a small portion of any of the Contents of the Abdomen passes along with it & prevents the Peritoneum closing round the Cord, and when this happens it produces that Species of Hernia called Hernia Congenita; hence it is, that this Species of Hernia is produced in our Infancy only, tho it may not be so much as to merit our Notice till or after Puberty — Dogs & some other Animals may be said to have a Internal Process of ye Peritoneum because the Communication between the Cavity of the Abdomen & the Testes is never shut up but allways free & open, hence these Animals very often have the Hernia Congenita without any Inconvenience to them except the Weight — Therefore we are to understand by ye Internal Process all the Coats which the Peritoneum gives to ye Diff^t Viscera, and by the External no other than the Tunica Vaginalis which is only properly called a Process of ye Peritoneum in Dogs & those animals which have the Communication between the Abdomen & Testes open — There is allways a small quantity of Water found within the

the Peritoneum and if accumulated in too great Quantity is the Cause of ye. Ascites, as that of ye. Pleura is of ye. Hydrops Pectoris — It is disputed whether this Fluid is Secreted by Glands or deposited by Vessels; but no Glands can be shewn here and therefore it is the most reasonable to suppose it deposited by Vessels; its use is the same to the abdomen as the Liquor Pleura is to the Thorax &c. The Peritoneum has many fine Vessels spread upon it, some of which are supposed to deposit the above Fluid and others absorb the superfluous part of it &c — It serves not only as a Covering to the Viscera of the abdomen but also by its attachment to them keeps them confined in some measure & prevents their being displaced —

A general View of the Viscera of the Abdomen ——

The Peritoneum being removed, the Epiploon or omentum presents itself to our view, lying loose over the Intestines; this being turned aside we see the Liver situated on the right Hypochondrium occupying allmost all that Space, & adhering to the inferior surface of the Diaphragm; it is divided into 2 Lobes

the

the right & left, the least of which lies partly over the Stomach, which is situated in the left Hypochondrium inclining across the Spine and having passed to the right of it, it meets the first of the Intestines called Duodenum at which place it is called the Pylorus – On the inferior part of the largest Lobe of the Liver is placed that membranous Bag called the Gall-Bladder, which is not allways covered by the Liver but often projects beyond the Edge of it especially in strong Expirations when the Liver is drawn upwards by the Diaphragm: hence the Reason that this Bag is often wounded when the Liver remains unhurt by penetrating wounds of this Part which some apprehend is impossible. When we remove the Stomach the Spleen appears situated under the left or great Extremity of the Stomach called Cardia where the Oesophagus enters, it's inferior part rests upon the upper part of the left Kidney – The action of the Diaphragm must compress this Viscus & the Stomach also from its connections with them – The Pancreas cannot be seen without removing the Intestines, but it lies under the great Curvature of the Stomach to the

left

of the Duodenum to which it adheres, and then runs across the Spine to the left & its Extremity lies in Contact with the Spleen —

The Epiploon or Omentum is a thin membranous Bag, resembling a tucked up apron, hanging down from the Stomach loosely over the Intestines as low down as the Navel, but sometimes much lower reaching even into the Pelvis: it is generally fixed to the Duodenum, to the great Curvature of the Stomach and to the arch of the Colon superiorly; hence when it descends into the Scrotum in Hernia, it causes a Sickness & violent pain in the Region of the Stomach in consequ.ce of its attachment to the Stomach & its drawing it by that means downwards. It has a No. of Vessels ramifying thro it, and is interlarded with more or less Fat in proportion to the Habit of the Person; Some say that by its Oil or the Fat which is contained within it the abdominal Rings often become relaxed & by that means paves the way for Hernia; but this opinion is groundless, as the Rings are tendinous & inelastic, & conse-

quently

consequently will not dilate by any means or be rendered more yielding or extensible by any unknown matter whatever, and therefore cannot be affected by the Omentum tho it should lie in immediate contact with them - Hence it may perhaps be asked what is the Cause of Ruptures in general if we will not admit this as one? The most common & general Cause I believe is a mal-formation of the Rings, i.e. they are so large as to admit y^d. Intestines to push thro them with very little or no Force or at least no more than is exerted in crying &c. as in young Children, whom we find are more commonly afflicted with Hernias than adults, and as they are more freq^t. in those so they are less dangerous than in these; in Children they will easily return on lying down and are supported by a proper Bandage & by that may be cured without the Operation being necessary whereas in adults we are often obliged to have recourse to the Operation for the Safety of the Patient. The Omentum appears at first to be a single Membrane but it is a Compleat Bag or Pouch which

many

may be made very apparent by blowing air into it between its attachment to the Stomach & Colon. The principal use of the ~~Colon~~ Omentum seems to be to lubricate the Intestines & Viscera by its being loaded with so much Fat, to prevent adhesions of them & the Peritoneum, as when it is wanting as is sometimes the case being wasted or consumed by Disease there has a general adhesion of the Subcontained Viscera & the Peritoneum taken Place — Sometimes it has been found very much enlarged, which was the Case of a Girl lately in the Hospital whose abdomen was greatly enlarged and distended without the least Fluctuation; the Disease was suspected to be in the Integuments only and a Caustic was applied on both Sides of the abdomen on the most prominent Parts of it; this afforded her no relief & she died shortly after. On opening the Cavity the Surgeons found the Integuments very thin and the Tumour occasioned entirely by a thickening & enlargement of this membrane which appeared of an almost incredible Thickness. The Situation of the Intestines is such that the Smaller lie in Folds in the middle of the Cavity and

and entirely surrounded by the ~~latter~~ larger. The Duodenum begins at the right Extremity of the Stomach called the Pylorus and runs in a folded Direction for about 12 Hands Breadth in Length: ~~from the~~ right side of the Spine it crosses over to the left Kidney, then to the right and again to the left side when it takes the name of Jejunum, which being continued in a convoluted form a little way is called then Ileum: these three make up the Small Intestines. The Ileum terminates in the first of the large Intestines the Cæcum at the appendix Caeci, from which the Cæcum is continued for some distance & then commences Colon, tho there are no marks which can be discovered to point out the exact Termination of the one & beginning of the other of these Viscera; however as soon as the Colon begins, it mounts upwards in an oblique Direction passing under the right Lobe of the Liver then under the great Curvature of the Stomach across the Spine to the left Kidney where it takes the name of Rectum wch is continued to the Anus. From seeing the Situation & attachment of these Viscera to the Liver, Stomach &c. it is easy to conceive what great

service warm Clysters may be of when any of these Parts are inflamed or diseased; they will assist in a double Capacity; first in emptying the Rectum & large Intestines of hardened or indurated Faces which perhaps were the Cause of the Inflammation or by their lying there might keep it up, and secondly by their pleasing and agreeable warmth they serve as Fomentations to all the Intestines & parts adjacent, and for this Purpose they ought to be thrown up in large Quantities much larger than is usually ordered, for there can no Inconvenience come from the quantity as the large Intestines will contain a very large quantity. Of the good Effects of large & frequently repeated Clysters we have often Instances in the Stone & Inflam.n of the Bladder where they act only as Fotus's and by that means relaxing the Parts often remove suppressions of Urine — I have known a Tumour formed externally near the Umbilical Region by hardend Faces contained within the Cæcum — Under the two Lobes of the Liver lies the Meso-Epiploon which is a membrane similar to the

Omentum

Omentum; and under this to the left of the Stomach is situated the meso-Gaster, in which are situated the Hepatic & Cystic Ducts of the Liver going to the Duodenum — The Situation of the Stomach is across the Spine, but its exact Situation must be altered by its State of Dis:=tension either with Aliment or Flatus, at which time its Fundus reaches low down and pushes the other Viscera downwards, and it likewise extends high up & presses against the Diaphragm — hence it is evident that a wound may injure the Stomach at this time which at any^r time when it was flaccid & empty would not touch it. —

The Mesentery is that Membrane by which the Intestines are fixed to the Loins: it is only a Duplicature of the Peritoneum as has been before observed — By its attachment to the Intestines it confines them in Folds, which seems to have been designed by Nature that the aliment might be longer in passing thro these Canals in the Human than in some of the Animal Species; for Inst^ce the Wolf & Cormorant which we are told have but one Straight

Intestine

Intestine; hence they are more Voracious, tho their Hunger is sooner Satiated and returns more freqtly — whereas by the great Length of the Human Alimentary Canal the Lacteals have more time to collect all the Chyle from the Aliment before it is ejected by the anus. I have already observed that all the Vessels which pass to & from the Intestines run between the two Laminæ of this Membr.: ~~and the Mesentery~~ and the Mesentric Glands as they are called — are also situated ~~between them~~ thro which ~~run the Lacteals~~. I one assert that this Membrane serves to prevent the Twisting of the Intestines and their being entangled with one another in their Peristaltic Motion; and indeed a Twisting of the Intestines, tho' the Term is often used, never can happen, on accot. of their attachment to the Loins. — An Intersusception may happen, i.e. when one Part of an Intestine pushes itself a little way into anotr. Part of it either from ~~above~~ above downwards, or vice versa; this Disorder is sometimes attended with most excruciating Pain &c. and if not speedily remedied by V.S. Fotus's, Clysters, aperitives &c. Death will ensue or it terminates in what is called Iliac Passion — I have freqtly observed these Intersusceptions in Children, in some, 20 or 30 of them; and in them perhaps they may be attended with no Inconvenience, Pain or Danger —

It is common to see the Mesenteric Glands greatly enlarg'd & diseased in Scrophulous Habits, and in such Constitutions as have a Disposition in them for Cancers we find the cancerous Virus often falls upon these Glands; hence it is not unusual to enquire of such Patients if they have had Pains in the Bowels before we extirpate any cancerous Tumour from any Part of the Body, and if they complain of Pain in these Parts we have great Reason to suspect the Virus has fallen upon these Glands and caused them to be much vitiated –

The Vena Portarum is formed by the Junction of all the diff.t Veins which return the Blood from the Intestines &c. and is the Secretory Vessel of the Liver; the Hepatic artery serving only to carry Blood to this Viscus for its nourishment – The Ductus Hepatic. is the excretory Duct of the Liver which meeting with the Duct. Cystic. coming from the Gall-Bladder they unite & form the Ductus communis Choledochus which carries the Bile into the 1.st of the Intestines, the Duodenum – Thro this Duct I have known several Gall Stones pass & dilate it considerably; and it is owing to an obstruction of this Duct by these Gall Stones that the Gall cannot pass into the Duodenum & therefore is absorbed into the Habit & produces, amongst other causes the Jaundice –

The Oesophagus is the beginning of the Alimentary Tube

* I once saw small granulated bodies, about the size of Bullet seeds, between the muscular & the internal coat of the canal; to which some anatomists might give the name of glands. In this subject they were very numerous; but though I often looked for them afterwards I was never able to discern any in a vast number of subjects which I had an opportunity of examining — Vide a preparation of them in Mr. Hey's Museum, which I made at the time I discovered those little bodies — Burnham.

Tube, and is partly membranous & partly muscular. It begins at the upper & posterior part of the Neck where the Pharynx terminates which is opposite the cricoid Cartilage of the Trachea; it passes down behind the Trachea, and, when it gets into the Cavity of the Thorax, to the left of the Aorta and piercing thro the Muscular part of the Diaphragm terminates in the ~~right~~ left Orifice of the Stomach called Cardia – It is composed of a Diff.t No. of Coats according to different authors, some say it has two, others three, four, and some five – The 2 first are nothing but the Covering given it by the Pleura in the Thorax, and the Cellular membrane which adheres to it; the 3d. is its muscular and is 2 orders of muscular Fibres one running Circularly the other longitudinally; the longitudinal enlarge the Canal for the Passage of the aliment, whilst the Circular contract to propel it onwards towards the Stomach – The 4th. Coat called its Nervous is only a little cellular membrane lying between the muscular & the internal or cuticular Coat ~~the Villi~~. In this cellular membrane some have described Glands * which they say deposit a mucus on the inside of the Oesophagus to lubricate it; but I never could discover any Glands or secretory Ducts here and I believe there are none and that the mucus is deposited here by Vessels: the Vesalian Glands at the inferior part of this Canal are only Lymphatic Glands ~~which may about a part of the~~

Mucous. The principal use of the mucus is to lubricate the Passage & smear the aliment to facilitate its Passage into the Stomach — The 5th or internal Coat is called Villous from the number of little Hairs standing upon its Surface: it is the same in the Stomach & all the Intestines and is very vascular, hence it serves to transmit the mucus to its internal Surface thro' some of its Vessels. Some say that this internal Coat is a Continuation of the Cuticle lining the Fauces, which descends thro' all the Intestines quite to the anus; but this is absurd — The whole alimentary Canal is liable to Strictures in the same manner as the Urethra but especially the Oesophagus, which till lately were looked upon to be incurable; but Dr. Munckley, Physician to Guy's Hosp.l relates the Cases of several Patients whom he has cured by mercurial Frictions on the Part in such quantity as to excite a moderate Discharge of Saliva taking care to prevent its affecting the Glands too much by interposing cathartics at proper Intervals — A Man in St. Thomas's lately had a considerable Thickening of the Thyroid Cartilage of y.e Trachea whereby the Oesophagus was so much compressed as to render Deglutition very difficult; it was occasioned by a violent Cold, and the Trachea was so much obstructed as to render his Breathing very

laborious

Since the delivery of this Lecture Mr. L. has reasons for thinking that in all those cases where mercurial Friction is said to have cured it is very doubtful whether any Stricture really existed. In true Strictures of the Oesophagus he recommends the Introduction of moderate sized Bougies repeated at proper intervals according as the patient can bear it as a method that he had made use of with great relief to a Lady who was under his care for this Complaint. Since the melancholy Death of poor Mrs. I have attended this Lady; who very justly attributes her present Existence to the above mode of Treatment. The Size of the Bougie, manner of introducing it, with a particular history of Mr. Case, I mean to present to, in a Paper, to the Editors of the London observator.

B.

laborious & difficult and his Speech was so faltring as not to be heard - The operation of Bronchotomy was proposed & would have been performed had he not found relief from the method just recommended which was thought proper to be tried before the Operation should be concluded upon. a small quantity of Merc.l ointment was rubbed in every Night and a Flannel kept round his neck, a cathartic Solution being given at proper Intervals, by which he found relief in a few days & was perfectly cured by it -

The Stomach is said to resemble a Bag-Pipe in Figure: we find it much larger in Some than in others; it is supposed to be larger in proportion to the appetite and is often found large in People addicted to Gluttony and in hard Drinkers the Coats are found much thickened; but this is not always constant - The Pylorus is generally thickened in People subject to freq.t Vomitings; and I have seen a large Fungus of the Polypus kind in the Stomach similar to the Polypi of other mucous Membranes; - freq.t Vomitings without any apparent Cause may sometimes denote this Fungus in the Stomach - The Stomach is divided into its Fundus or great Curvature, the small Curvature, & its two orifices called Cardia & Pylorus.

It has 4 arteries spent upon it, viz, the Coronary, Gas=
=trica dextra and Sinistra, and anoy.r small one –
There is a great analogy between the Stomach and
Oesophagus in their Structure, and there are the same
number of Disputes concerning its Structure; but
the Oesophagus has only 2 Coats, where as the Stomach
may be properly said to have 3: the first is a continu=
=ation of the Peritoneum and is called its membra=
=nous; under this is the muscular which is com=
=posed of two orders of Fibres running one in a longitu=
=dinal Direction which is external, the other the inter=
=nal order taking a circular course: they are stronger
in some Parts than in others, and by the different actions
of these Fibres they serve to move the ~~Stomach~~ Contents
of the Stomach in different Directions & assist in some
measure in Digestion. The next is the villous Coat which
is very vascular and when injected appears an entire
Series of Blood=Vessels. These Coats are all seperated
from each other by Cellular membrane, and the internal
villous Coat is much more spacious than the muscu
=lar which will account for the Rugæ observeable on the
inside of the Stomach when it is empty – The Gastric
Glands which are supposed to deposit a Fluid to assist
in Digestion are said to be situated in the Cellular
membrane between the villous & muscular Coats; but I
believe

* It is the opinion of a celebrated surgeon & anatomist that the Gastric Juice acts as a menstruum upon the Aliments in digestion; ~~and I suspect that this juice and the~~ ~~[illegible]~~ ~~[illegible]~~ that when the stomach is empty it will prey upon its coats, and that it is of so acrid a nature as ~~to~~ even to erode ~~the~~ the coats of the stomach after death. I have myself seen many instances of this in children.

B

believe that there are no such glands for I never could discover any such by repeated Experiments, & I make no doubt but this Fluid is deposited by Vessels. *
The Orifice called Cardia is that where the Oesophagus enters and is larger than the Pylorus which is where it meets the Duodenum, and at which place it has a Stricture or rather a Circular Valve the use of which is said to be to prevent the aliment passing out of the Stomach before it is properly digested to mix with the Bile & Pancreatic Juice: hence we find that when we have swallowed any hard substance which is not so easily digested as aliment, a considerable Pain is felt some time after at this Orifice which is occasioned by its endeavouring to get thro this Orifice — We have frequently Strictures in this Part occasioning Pain in the Stomach, Inflammation & vomiting, and if not speedily removed will occasion death, as even Fluid aliment cannot Pass — With regard to Digestion, vid. Chap. on the Course of the Chyle — Page ——

The Intestines are of the same Structure with the Stomach, their muscular Coat giving them their Peristaltic motion — Their Internal Surface like that of the Oesophagus & Stomach is lubricated or lined with Mucus which is deposited in Follicles by Vessels in the same

manner

manner as in the Stomach; and these Follicles are very visible — The Length of the Intestines is different in different Subjects; in general, I believe they are about 5 or 6 times the Length of the whole Body, tho some say more — On the inner Surface of the Intestines are a No. of Valves called Valvula Conniventes taking a Circular Course & hanging down in the Canal; they are only Elongations of the inner Coat which project & hang loose in them and admitting the Faces to pass in any Direction as we see very often in Injecting Clysters which will pass even into the Stomach. The use of them is certainly to enlarge the Surface of y. Canal by which means more Lacteals may arise from it to absorb the Chyle so that none may pass with the Faces thro the anus but be carried into the Circulation for the nourishment of the Body — The use of the Intestines is to perfect Digestion, Seperate the Chyle, and contain the Faces & Expell them by the anus — The absorption of the Chyle is principally performed in the Small Intestines for which Reason we find the Lacteals more numerous in them than in the large, which receive the Faces after most of the Chyle is drained from them & absorbed by the Lacteals in the Small ones.

The Duodenum is the first of the Intestines & is one of

the

the small; it is about 12 Fingers breadth in Length & passing from the right to the left side commences Jejunum. It is not connected to the Stomach & adjacent Parts by the mesentery, but by the Peritoneum which covers it & it is observed that it's Coats are thicker than those of the other Intestines — Digestion is perfected in this Gut; for the Ductus Choledochus & Ductus Pancreaticus open into this Intestine and empty their diff.t Fluids of Bile & pancreatic Juice which mixes with the aliment & is supposed to be necessary to compleat digestion: hence we find but few Valvulæ Conniventes above the place where these Ducts enter the Gut but immediately below they begin to be very numerous —

The Jejunum is nept, but we cannot fix the exact place where it begins or where it terminates: it's only Peculiarity is it's great no. of Valves which are much more numerous than in the Ileum —

The Ileum is the 3.d & last of the small Intestines & takes its name from its situation in the Iliac region, from whence it descends in Folds or Convolutions most inclining to the right side — This Gut is most freqtly forced down in Hernias — The Ileum terminates

in

in the Cæcum which is the 1st. of the large Intestines and is known by its appendix. This Gut is differently described by diff.t Authors, some calling the appendix of it the Cæcum whilst others say that this large Gut is continued some distance beyond the appendix Cæci and then commences Colon. The appendix is considered as a Reservoir for mucus with which it is generally filled and which I look upon to be intended to soften the indurated Fæces which are now by the time they arrive at this Bowel become quite hard being drained of almost all the Chyle, and to lubricate the Passage that they may pass the easier; on this Intestine are observed 3 longitudinal Bands, which I imagine serve to shorten the Canal when they act & thus strengthen the Intestine in propelling the Fæces thro it. The Valv. Cæci are similar to the Valv. Connivent. The appendix Cæci is very large in Quadrupeds; and in Fish they are very numerous. I generally reckon the Cæcum about 4 Fingers breadth in length. The principal peculiarity of this Intestine is that where the Ileum terminates there is placed a Valve which is so situated that it will permit the Fæces to pass freely towards the Anus, but will

prevent

prevent its Return back out of the Cæcum into the Ileum, tho it will admit Fluids to pass backwards as is seen in Clysters sometimes — The Colon has many fatty Bodies upon its Surface which are called appendices Epiploicæ and are similar to the omentum in other parts — about its middle upon the inner Surface are placed many Valves — The Rectum is the last Intestine: its muscular Coat is stronger than any of the others but the villous more smooth & even — It has the Peritoneum reflected over its anterior Surface which is there called meso-rectum — It is connected inferiorly to the Levators & Sphincter ani muscles and is surrounded by a no. of fatty Bodies or Substances — On its internal Surface are a no. of Follicles which contain a mucus to lubricate the passage for the easier Expulsion of the Fæces.

Of the Liver

This Viscus is situated in the upper part of the Cavity of ye Abdomen to ye right side immediately under the Diaphragm & extending low down, its left Lobe lying over part of the Stomach & Pylorus — its Superior Surface is smooth rounding & convex, the inferior Surface is irregular & uneven — the Superior Surface lies under the intercostal muscles and its inferior turned towards the Spine — Its Ligaments are the Ligament. Suspensorium, Ligament. Rotundum, & lateral and coronary; tho' in reality they are not ligamentous: the first & least are continuations of the Peritoneum by which it is attached to the Diaphragm & kept suspended; the Ligam^t^. rotundum is the remains of the Umbilical Vein of ye Fœtus — Being fixed to the Diaphragm it obeys the motion of that muscle and is raised or lowerd by the action of it — All animals which have much motion in their Backs have their Livers divided into many lobules, as the Cats & Dogs &c^a^. but the human Liver is divided into two Lobes only by a Fissure in its middle; tho some anatomists make three, calling a little Eminence on the

*. The Ligam^t. Rotundum is sometimes found pervious in adults, having Blood circulating thro it; and this circumstance we ought to recollect whenever we are to make an Incision in this Part of the abdomen — In making Incisions in the abdomen 3 Cautions are to be observed; viz, the above as one; another, to avoid wounding the Linea alba; and the other to avoid wounding any consid^ble Branch of ye Epigastric Artery.

inferior surface ye 3^d Lobe under the name of Lobulus Spigelii – There are two other Eminences on its inferior surface called Porta, ~~between~~ which the Vessels run to the Liver – There are several Depressions also on the inferior surface; the most remarkable of which is filled up by the Gall-Bladder, and anoth^r in the great Lobe which is formed by the right Kidney upon which it rests, as also one in the left where it rests upon the Stomach – The Liver is not divided into two perfect Lobes like the Lungs, tho it has several Fissures in it, the most remarkable of which is that ~~in~~ which is caused by the Ligament. Rotundum ~~&c~~ The Vena portarum enters at the inferior part ~~then~~ at which place it is called Glyssons Capsula. The Vena Portarum is made up of the Veins coming from the Intestines, Spleen, Pancreas &c. all of which joining, form one Trunk at ~~the~~ Glyssons Capsula. It is the only Vein in the Body which performs the Office of Secretion: it ramifies thro the Substance of the Liver, some of its minute Branches terminating in the Pori biliarii which uniting form the Duct. Hepatic. the excretory Duct of the Liver; the others terminate in some of the Hepatic Veins which return

the

the Blood brought by the Hepatic arteries into the Vena Cava; and these Veins generally enter the Cava in three Branches a little before it enters the right auricle – They have no Valves — The Hepatic Artery comes from the Coeliac and serves to carry Blood entirely for the Nourishment of the Liver & has no share in the Secretion of Bile, which is performd entirely by the Vena Portarum

The Jaundice is only an Error Loci of the Bile; for the Pori Biliarii being obstructed either from a Schirrus in the Liver or Stones blocking up the Passage into the Duodenum, it is returned back & passes into the Hepatic Veins & by them into the Vena Cava &c into the general Mass, tinging the Cutis &c. of a yellow Hue –

There have been and stiee are a great Disputes abt. the manner in which Secretion is performed in the Liver (and indeed in other Glands); some being for the Malpighian or Follicular Doctrine, others for the Ruyschian or Vascular: as I never could discover any thing like Follicles in the Liver or in any of those Glands concerning which the Disputes

*. Vid. Lind on Diseases of warm climates. p. 88 to 97.

epist, I am inclined to be of Ruysch's Opinion, that the Branches of the Vena Portarum terminate immediately in the Pori biliarii without the Intervention of any Follicles —.

Wounds of the Liver are very dangerous as indeed are those of the other Viscera & all penetrating wounds in which we should endeavour as much as possible to prevent the external Air getting into the Cavity which would increase the Inflammation Subsequent to those wounds. Slight wounds of ye. Liver may not be fatal, but if the wound is deep a profuse Hamorrhage will ensue which will prove mortal — We should endeavour to mitigate the Pain, Inflammation & Symptomatic Fever which is generally very high, by freqt. V.S. Diluents, Aperients, Enemas, Fotus externally &c. The Liver is also liable to Inflammation, Suppuration, Abscesses &c. and abscesses pointing externally may be opened by Caustic &c. well in a good Habit*. And in obstinate Jaundices & Dropsies we frequently find hard Schirrous Knots which may be felt by pressing upon the Region of ye. Kidney, and these will sometimes remain after the Disorder is removed: in such Cases however, the Disorder will return again

very soon, so that we can only palliate the Disease from time to time, unless we can resolve these hard Schirri which in bad Habits and where ye Disorder has been of long standing it is very difficult to effect.

The Gall-Bladder is a membranous Bag of a Pyramidal or Conical Form situated at the inferior part of the Liver and near the Pylorus of the Stomach so that when the Stomach is distended with aliment it presses upon this Bag & forces out the Bile into the Duodenum to mix with the alim^t. as it is thrown thro' the Pylorus into that Intestine; at which time the Bile is most wanted — The Gall-Bladder is divided into it's Fundus, Cervix & Body: it has three coats similar to those of the Stomach, viz, the Membranous which is a Continuation of the Peritoneum, the Muscular & Villous; the inner villous coat however is not so smooth & villous — It is very vascular; it's artery comes from the Hepatic & is called the Cystic artery — It's Duct runs a little way from it & then meets with the Ductus Hepaticus and uniting form the Ductus Communis Choledochus which enters with an open mouth

into

into the Duodenum. The Ductus Cystic. is of the same Structure as the Cyst itself at its beginning at the Coop of ye. Cyst are placed little Valves which are loose & floating like the Valv. Conniventes of the Intestines — It is a dispute in what manner the Gall-Bladder is filled with Bile, whether by Regurgitation or by other Ducts in the Liver besides the Pori Bilarii which are called Cysti-hepatic Ducts and which ~~they~~ are said to empty Bile into the Cyst & by that means fill it; but I never cond discover any of these Ducts and it is now the general opinion that there are none such and that the Gall-Bladder is filled by the Bile being brought by the Pori bilar. into the Duct. Hepat. & by this into the Duct. Com. Choledoch. which by some means or other shall be obstructed as by alim^t. in the Duodenum &c and the Bile not having a free easy Passage into the Duodenum regurgitates thro the Duct. Cystic. into the Gall-Bladder which serves for a Receptacle or Reservoir for the Bile till it is wanted or till it ~~becomes distended~~ and distends the Cyst and then it passes out occasionally into the Duodenum: and from this it is evident that all the Bile does not

Pass

pass into the Gall-Bladder, but that some of it goes thro the Duct. Hepatic. immediately into the Duodenum — What confirms this opinion of the Regurgitation of Bile thro the Duct. Cystic. into the Gall-Cyst, notwithstanding there are some who say the Valves of y^e. Duct will prevent it, is ~~the~~ a Case ~~of~~ in which there was a Stricture upon the Duct. Cystic. & that side of the Duct ~~was obscured~~ next to the Duct. com. Choledoch. was observed to be greatly dilated by the attempts of the Bile to regurgitate, but on the other side of y^e. Stricture next to the Bladder it was small & allmost impervious — Stones are often found in the Gall Bladder, and it is the general opinion that they are formed by the transudation of the finer parts of the Bile which leaves the grosser parts behind & concretes & forms stones — These Stones are diff^t. from those of the urinary Bladder, being Specifically lighter than water —

Of the Spleen

Its Use is so little known that it may be justly considered as the Opprobrium of Anatomists —

It is situated deep down in the left Hypochondrium and is well defended externally by the Ribs; its Colour is a dusky brown — In some Subjects I have found two or three Spleens, but in general there is but one; when there are more they are smaller in proportion — Upon the external Surface there are several small Fissures —

This Viscus has 3 Surfaces, 2 Extremities & 2 Edges — The Surfaces are, Superior, which adheres to a Ligam.t of a convex form; and 2 Inferior, one flat turned towards the Ribs to the left, the other more convex & rounding —

The Extremities are Superior & inferior — On the Superior Extremity rests the great extremity of y.e Stomach forming a Cavity or rather Depression more or less visible in diff.t Subjects; — the inferior Extremity rests upon the upper part of y.e left Kidney which forms a noy.t Depression.

It is every where covered by the same Peritoneal Coat reflected over it as the Liver & other Abdominal Viscera, and has no other Coat, tho' some describe it as having ~~two~~ proper Tunics under this, which is the Case in Sheep & Calves, but in the Human Spleen ~~two~~ cannot be shewn; in young Subjects it has the appear.e of 2 Coats just where the Vessels enter, but this appear.e is lost in adults —

The Vessels of this Viscus are Arteries, Veins & Nerves; the Artery is a large Branch of ye. Celiac and taking a winding Course enters the Spleen in an Oblique Direction ~~to~~ by several Branches at its inferior Surface, at which place the Veins return in the same manner as the Arteries extend, and these Veins have a considerable Share in forming the Vena Portar. of ye. Liver — The Lymphatics are very numerous and in Calves very apparent, if it is first macerated in Water till the Blood is drained out of it and by a small Puncture made into it air is thrown into it; by which a number of them will become inflated.

The Substance of ye. Spleen seems to be very similar to that of ye. Liver, tho rather more delicate and of a more blue or Darkish Colour, which from its resemblance to Blood coagulated induced the Ancients to call it Parenchyma —

The Structure of it is variously Described; some have said it is Cellular & reticular, others Vascular & Follicular, & even Glandular; which last opinion Ruysch & Malpighi were of, but Ruysch lived long enough to be convinced of his mistake in supposing it to be Glandular, for no Glands or Cells have been discovered by any fair Experiments yet made — It is very Vascular which is all that we

know perfectly of its Structure at present — Some who have adopted the opinion of its being Cellular have compared it to the Pony, but this Hypothesis can by no means be supported, for if this were the Case there must be another Series of Blood Vessels to abvert the red Blood, which cannot be demonstrated; but to prove it to be Cellular, they first inject Water into it till it is entirely Cleansed of its Blood and being dryed it will appear Cellular, but this cannot be allowed to be a fair Experiment; for we know the Spleen is of so Delicate a Texture that our so little Force is sufficient to break down its Vessels & hence when Dry it will appear Cellular; it is so Delicate in young Subjects that we can Seldom succeed in Injecting it without Extravasation from a Rupture of its Vessels, tho injected with the greatest Care & gentleness; in a healthy & successful preparation this way by Injection it appears to be a Series of Blood Vessels —

Those who assert it to be Glandular, speak entirely from the appearance they may have observed in the Spleens of Brutes, which is not to be seen in the Human Spleen

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Its Size is Different at Different Times, not only when Diseased but when in a Sound State: it is said to be larger or Smaller in proportion to the Prepara

Pressure of the Stomach upon it; thus when the Stomach is full it presses most upon it and by its Pressure forces the Blood out of ye. Splenic Vessels and consequently makes it smaller than when the Stomach is empty, at which time the Pressure being removed, the Vessels again become distended and the Spleen enlarged. By Disease it is capable of being enormously enlarged, and what is very remarkable in such Cases is, that it will still preserve not only its Figure but its natural appearance without any apparent marks of Disease — In one Subject which I dissected the Spleen weigh'd 9 Pounds —

Its use is not known the many Experim.ts have been made upon Animals to ascertain this; we are told of a Bitch who had the Spleen taken from her Kept afterwards had Pups; Dogs have had their Spleens taken out and no visible alteration has followed; the some contradict this and say that the animal becomes more voracious, mangy, and surly ever after — Some suppose it secretes a Fluid which passes by the Vasa Brevia into the Stomach to assist Digestion; but as these Vessels are similar to all other Arteries it is not probable that any Fluid of this kind passes thro them. Dr. Mead is of opinion, & it is probable it may, that it assists in Digestion

but in what manner he is at a loss to determine unless it is by a fluid conveyed thro the Vasa Brevia, which we have already observed is not probable — Dr. Stukely has wrote an elaborate Treatise upon this Viscus, in which he mentions a remarkable Instce. of a Dog without a Spleen, which Dr. Mead then a Student at Leyden had procured in order to remove it, but, says he, the Dr. upon opening the Cavity & searching for the Spleen, found that one of his fellow Students had already removed it with the same intent as he himself proposed to do it, to observe whether the loss of it would be attended with any material alteration or not — Some, from observing its loss attended with no inconvenience to the Dog, have supposed it to be of no Service to the animal, but Dr. Mead observes that the Dogs after the Spleen was removed, became very peevish & churlish, and their Stomachs were always greatly enlarged if they survived it long; I myself dissected a Woman in this Theatre and found no Spleen or the least appearance of Pus in the Cavity of the Abdomen, but the Stomach was inordinately enlarged —

This Viscus is seldom wounded as it is so well defended by the Ribs; Wounds of it if deep and the

artery is divided are generally mortal; and they are more dangerous than wounds of the Liver as the artery is larger; if the wound is not deep & the artery not divided, some part of it will slough away & no bad consequence ensue; the Dressings should be entirely superficial with Dry Lint &c — I have heard of a Dragoon in ye. late wars in Flanders who was wounded in this Viscus, a considerable portion of which pushed thro the Wo.: he was not brought to ye. Surgeon till the next day, yet by proper applications he recovered, a great part of it mortifying & sloughing away —

The Ancients thought the Body contained two sorts of Bile, the one secreted by the Liver which they called Choler; the other from the Spleen which they called atra bilis; and a Redundancy of this last was supposed to be the Cause of Melancholy & maniacal Affections; however this Doctrine hath been long since expunged —

It is now the general opinion amongst anatomists that it assists the Liver in forming the

Bile, by producing some change upon the Blood w.ch is sent to it and which is then carried by the veins into the ~~Liver~~ Trunk of y.e Vena Portar. where it mixes with the other Blood & Fluids brought from the other Viscera of y.e abdomen and there uniting all together constitute a Fluid proper for the formation of Bile —

Of the Pancreas

The Pancreas is situated lower down in the Cavity than the last Viscus and lies transverely across the Spine under the great Curvature of y.e Stomach. It somewhat resembles the Tongue of a Dog in Figure. Winslow divides this Gland into two Parts, the little and the great Pancreas, but this is unnecessary and improper; its broad Part which resembles the Root of y.e Tongue adheres to the Duodenum and is what Winslow calls the great Pancreas; it then becomes more narrow as it passes towards its apex which Winslow calls the small Pancreas —

It has two Surfaces, one turned towards the abdominal muscles, & the other towards the Spine —

It is a fine Instance of y.e conglomerate Gland and is very similar to the Parotid & Submaxillary Glands,

putting on when opened the same corpuscular appearance
and we find it affected by Mercury in the same manner
they are; and Astruc gives it as his Opinion that the
Diarrhoea which frequently attends especially at the begin
ning of a Salivation is caused by the mercury affecting
this Gland so as to produce a greater Secretion and
Discharge of ye Pancreatic Juice which in every respect
is similar to the Saliva of ye Salivary Glands —
There are various Opinions about the manner in which
Secretion is carried on in this Gland: some say it is
performed by Vessels which terminate in
Follicles; whilst others say it is vascular & that
there are no Follicles but that the Vessels terminate im
mediately in the Tubes which form the Excretory Duct.
This Gland seldom becomes Diseased —
Vessels sent to it do not come from any particular
Part, some come from the Splenic, others from other
Parts and they enter it from one Extremity to the other.
The Excretory Duct runs along the middle of it from the
Tail and gradually becoming larger as it approaches the
broad Part where it adheres to the Duodenum into which the
Duct opens and discharges the Juice secreted; and as it
passes along it has many small Ducts entering it on
both Sides thro its whole Length — This Duct is very
transparent and requires great care in finding it; it
was

was not found out till the last Century when Wurtzer discovered it in 1710 for before his Time it was mistaken for an Artery; he was assassinated the Evening after he publickly demonstrated it, and it was supposed by order of his cotemporary Anatomists thro Envy at his making the Discovery, but it afterwards appeard that this Opinion was groundless — The Duct enters the Duodenum near the Place where the Ductus communis Choledochus enters by which means the Pancreatic Juice & Bile are mixed together as soon as they get into the Duodenum; I have seen, however, an Instce where they entered at some Distance from each other, but this seldom happens —

There have been many & various Opinions about the use of this Gland, and it wond be needless to invent them here; the modern & most probable is that it secretes a fluid which is very necessary in Chylification & in some measure assists in compleating Digestion in the Intestines, assisted by the Bile — Some say they tried the Experimt. of removing this Gland and no ill Effect ensued but others contradict this & say that other Glands became diseased upon the Removal of this — Many Experiments have been made to know the Nature of its Juice and some have asserted it to be Acid; but none

of the Experiments ought to be depended upon, and it is the Opinion at present that its Juice is not acid but exactly similar to the Saliva of ye. Parotid & Submaxillary Glands — I am of Opinion that the Parotid & Submaxillary Glands are the only ones that Secrete the Saliva in ye. mouth & that the Lingual & other Glands situated about the Fauces only Secrete a Mucus to lubricate the Passage —

It may not be improper at this Place to follow the course of ye. Aliment, and therefore I shall just run over it in a short manner —
The Aliment being taken into the mouth is there ground down by the Teeth and impregnated with the Saliva, it is then thrown into the Pharynx which is a muscular Bag situated at the upper extremity of ye. Oesophagus which is a continuation of ye. Bag, and thro which the aliment passes into the Stomach where it undergoes its principal Change of Digestion —
It would take up too much time to give the many opinions with Respect to the manner in wh. Digestion is performed; let it suffice to say that Boerhaave adopted all the different opinions of its being performed by Heat, by the action of ye. Stomach & abdominal muscles, by a Menstruum, Exercise &c. and said that all of them might probably concur &c

assist in Digestion: and this Opinion seems to be generally come into —

The Alim.t having undergone a proper Change in the Stomach is then thrown ~~into~~ thro' the Pylorus into the Duodenum where it is mixed with the Bile & Pancreatic Juice: at this Place we suppose Chylification to take Place and that Absorption begins; not but I believe that there abs orb.t Vessels in the Stomach, but the absorption of d. Chyle chiefly is performed in the Smale Intestines in which there are much the greatest number of Lacteals situated; from thence the Alim.t is propelled onwards to the Anus by the Peristaltic motion of the Intestines, and when it arrives into the great Intestines it is generally by that time become hard & is called Faces which by its Stimulus promotes the Excretion of it thro the Anus — It is beyond a doubt that Lacteals or at least absorbents are Situated in the Rectum and other Large Intestines as well as Smale, tho' not so numerous in those as in the last —

Of the Course of the Chyle — 172

The Intestines we have seen are an [illegible] composed of muscular & membranous Canal extending [illegible] Pylorus to the Anus, flying in Convolu[illegible] On the inner surface of y. Villous Coat of y. Intestines are [illegible] the Lacteals which are vessels so called on acc.t of their carrying a white nutritious Juice of a milky nature called the Chyle — The Lacteals are very seldom to be seen in Dead Subjects, and never, unless the Body is opened soon after Death: the usual method of shewing them is to feed an Animal, a Dog generally, with Milk for some time and about ½ an hour after he has been well fed, to kill him and immediately open the Body, when they may be seen in great numbers filled with a white Milky Fluid; this tho' a very cruel one is the only method by which we can have a perfect view of them: I have seen some of them in Malefactors opened at Tyburn on opening the Bodies soon after Execution. Heister relates y.e Case of a Man who returning home from a Feast was murdered on the Road, & he being called in soon after, saw a great no. of these Vessels in the Small Intestines —— They exist in Birds, but the Chyle in them is of a Pale & more limpid Colour than in other Animals; they are likewise known to exist

on Fishes, tho' it was usually said they did not, untill Mr. Hewson at Dr. Hunter's evidently proved their Existence — Some assert they are only in the Small Intestines; they are certainly much more Numerous in them than in the Large, but if the Rectum has not any Lacteals it is beyond a doubt that it has absorbent Lymphatics, and we know there are Vessels in the Stomach which have a power of Absorption, tho' they are so minute as not to be easily discovered, and there is no doubt of Lymphatics or absorbent Vessels existing in all Parts of ye. Body — The Lacteals have a great number of Valves in them —

The Chyle then, being absorbed by these Vessels which arise with open mouths on the internal Surface of ye. Villous Coat of ye. Intestines, passes thro the different Coats of the Intestines, and running between the two Lamina of ye. Mesentery, passes thro the mesenteric Glands to the Receptaculum Chyli —

The Lacteals are divided into Different Orders, which I think quite unnecessary; the common method is to divide them into those of ye. first & those of ye. 2d. Order; they are called Lacteals primi generis ~~before~~ till their arrival at the mesenteric Glands, and having passed thro them they then commence those secundi generis —

By the Receptaculum Chyli we do not mean to signify a Bag or Reservoir for the Deposition of ye. Chyle, for it is only the beginning of the Thoracic Duct and is

formed

formed by the meeting of several of yd. Lymphatics bringing Lymph from different Parts of yc. Body, and entering at this Place with several Branches of yc. Lacteals, and which together form the Thoracic Duct making it here pretty large and hence it has been called Recept. Chyli. In some few Subjects it is so much larger at this Place as to make it properly called a Receptacle or Oval Bag, but this is very rare — It is situated just above the Emulgent Arteries to the right of yc. Spine and Aorta, almost behind the last, so that in the Diastole of yd. aorta it is compressed; it is placed between the Bodies of yd Dorsal & the first of yc Lumbar Vertebra lying under the right Crus of yd. Diaphragm — The Course of yd. Duct. Thoracic. from thence is directly upwards to the right of yd. Spine between the Aorta & Vena Azygos, and passing under the great Curvature of yc. Aorta gets into the neck & terminates generally in the left Subclavian just at its Junction with the internal Jugular. I say generally in the left Subclavian because it is sometimes found to terminate in the right — It sometimes terminates in two Ducts wh. go an Inch from each other, but most commonly single — Dogs are observed to have 2 Thoracic Ducts generally —

Pecket first discovered the Thoracic Duct by accident & hence it has been sometimes called by his Name — It is thin but very strong & elastic — Authors commonly

Describe

describe it as having several Coats but it appears to me to be one compact & firm membrane not capable of Seperation without Violence and Laceration; the membranous Coat as it is called is nothing more than the Pleura which lies upon it, and can no more be called a Tunic than it can be said to be a Tunic to the Aorta which is covered by it in ye. same manner. There are many Valves in the Thoracic Duct, but not so numerous as in the Lymphatics.

The Chyle being received into the Lacteals which arise small & gradually enlarge in their Passage to the Duct is by this means in some measure prevented from returning back into the Intestines, but it is chiefly prevented by the Valves, and is propelled onwards at first in the smallest part of the Lacteals by the action of ye. Muscular Coat of ye. Intestines till it gets into the Mesenteric Glands when it is pushed forwards by the ~~motion~~ action of ye. Mesenteric Arteries & other Vessels into the Receptac. Chyli, from whence it is carried forwards by the action of ye. Diaphragm, Aorta &c —

Wounds in any part of this Duct it is most probable would prove mortal, especially in the Cavity of ye. Thorax, as the Chyle would not only pass thro the wound & the Patient would become emaciated soon for want of nourishmt, but likewise on account of their Situation it is scarcely possible that the Aorta, Vena Azygos or Vena Cava should

escape

escape being wounded — An Atrophy or Marasmus may be brought on by an Obstruction in this Duct, and it is commonly found upon Dissection of People who dies of an atrophy that this Duct is Straightend or totally obstructed hence the Blood is Deprived of its Nourishm^t, the Chyle. The mesenteric glands become sometimes diseased & enlarged & in a great measure obstruct the Passage of the Chyle thro them hence the Patients waste away by degrees in proportion to the Degree of Obstruction; they are generally found indurated in Scrophulous Patients and in Children often appear greatly enlarged —

Some anatomists have thought that the red Veins or Veins which carry red Blood absorb as well as the Lacteals & Lymphatics, but Mr. Jno. Hunter lately proved in a Satisfactory manner by Experiments that they do not —

The Lymphatics are a Species of Vessels arising from all the different Superficies of ye. whole Body both external & internal and even from the Bones themselves — These are absorbent Vessels and terminate chiefly in the Course of the Chyle but some few terminate in some of ye large Veins. They are called Lymphatics on account of their carrying a fine colourless fluid, and are fine Pellucid Tubes — They are very similar to the Lacteals, having many Valves, and as the Lacteals pass thro the mesenteric glands so the Lymphatics pass thro

glands

Glands in different parts of y^e. Body, which are called Lymphatic Glands; their method of passing thro these Glands is a little singular, for just as a Lymphatic enters a Gland it divides into two, three or more Branches and ramifying thro its Substance it collects its Branches together again as it passes out of the Gland and passes on towards anoth^r. Gland which it enters in the same manner &c.; but the use of these Glands & the Vessels running in this manner thro them is not understood; it is supposed to attenuate the Lymph, as the Lymph by mixing with the Chyle in the Thoracic Duct is thought to render it more fit for Nutrition than it would have been without it by thinning of it —

These Glands are of different Sizes & Colours in different Parts of y^e. Body; they are of y^e. conglobate kind and are covered by a Smooth proper membrane — Disputes have run very high concerning the Structure of them, some anatomists alledging them to be cellular, and others contradicting it; Dr. Monroe Senr. & Dr. Hunter had a Paper War for some time about them, & we find Dr. Monroe very Severe upon Dr. Hunter for asserting they were Cellular; and he says he can produce Several Instances of Experiments which he made upon these Glands where three or four Branches of the Lymphatics have entered a Gland

and

and ramifying thro it have collected its Branches together again without depositing their Fluid in Cells in the Subst.ce of the Gland but have passed out of the Gland as usual: On the other hand Dr. Hunter proves they are Cellular — I am of Opinion that some of them are Cellular & others not, at least I have not been able to discover Cells in them all —

It has been a matter of Dispute whether the Lymphatics were Absorbents or not; but I think it admits of very little Doubt if we consider their Similarity with the Lacteals in the Intestines in every respect, and as these are Absorbents it is highly probable those are so likewise: indeed I think that their Power of Absorption is very evidently proved both by Diseases & Experiments; for Instances, the Lues Venerea is received by Absorption & is cured by rubbing Mercury on the Skin, which being absorbed or taken up by these Vessels is conveyed into the Circulation & thus excites a Salivation by which the Venereal Virus is conquered: the Ascites is another Instance of the Power of these Vessels performing Absorption — [Dr. Hunter, when on this Subject, is said to speak of the Plague as well as Lues Venerea, to shew the Power of Absorption in the Lymphatics — There is no Anatomist who now doubts of y. Lymphatics having this Power, but the Doctrine of y. Plague's being communicated this way is new, and Dr. Hunter

builds this opinion upon an Information which he has lately received from Doctr. Mackenzie who lately came from Constantinople where he resided many Years, and who says, that it is not uncommon in that City which is never free from the Plague, to find one Side of a Street infected from house to House with it whilst the opposite Side is perfectly free from it; this he attributes to their not holding any Intercourse with those of yd. infected Side. another Circumstance is, that there are Men who are constantly employed in burying the Bodies of those who die of the Plague and make no Scruple of handling them when Dead but are very cautious not to touch them till they are Cold, and these People, notwithstanding their office escape the Disease — Whether this Doctrine of its being communicated by the Touch only is true or not Physiologists must determine — This by the by] — The following Experiment is sufficiently convincing of yd. the Lymphatics having the Power of absorption; Take a Dog, open the Cavity of the Abdomen and pour a qty. of warm Water into it, sew the wound up close and in a few Hours examine the Cavity and the Water will be found to have been all absorbed: this Experiment has been frequently tried and always succeeded —

It was the opinion of Anatomists till very lately that the

the Lymphatics were only Continuations of the Arteries, & they supposed three Orders of Vessels, viz, the Sanguiferous carrying red Blood, the 2d, the Serous carrying only Serum and the 3d. the Lymphatics carrying a Fluid a degree finer than the Serum - They supposed these Vessels must be continuations of ye. Arteries because they observed that by throwing Quicksilver into them some of its Globules were pass into the Lymphatics; but this is no proof at all, for the Injection is thrown with so much Force & Violence that an Extravasation is brought on into the Cellular Membrane into which there are a No. of Lymphatics opening, and part of the Quicksilver gets into some of them & distends them — Let us suppose a Person from Contact with an Infected Person shall have a Chancre on the Penis which being neglected, the consequence of this will be a Buboe in the Groin, which agrees exactly with the Course of the Lymphatics, they running from the Penis thro the Groin & making their way to the Thoracic Duct. The Venereal Virus may be taken into the Habit by a Wound in any part of the Body and a confirmed Pox may be produced, as by a Wound in the Finger from which the Virus being taken up by the Lymphatics causes a Swelling and sometimes an abscess in the arm Pits, and this Swelling takes the same Course with the Lymphatics in this

Part.

Part which shews that they are principally affected by the Virus: the same observation holds good in any other part of ye. Body, hence a knowledge of their Course is very necessary & useful. Since this Discovery of ye. Lymphatics some Surgeons have attempted ye. Cure of Scrophula & indurated Tumours which are very common to Children of relaxed Habits and appear in the Neck, by rubbing Mercury upon the Head which being absorbed by the Small Lymphatics there, is conveyed to the diseased Glands in the Neck; and this method bids fairer for Success than by applying it immediately on the Tumour which can have no effect in resolving the obstruction; and it can answer no purpose to apply the Ointmt. below the Part, because tho it is absorbed yet the Lymphatics which take it up do not run thro the diseased Glands in ye. Neck, and therefore can have no Effect upon them — It is therefore very necessary that we should attend to the Course of the Lymphatics, to the Gland that is affected & from what part the Lymph flows to it, and at that part we are to rub our Ointmt., e.g. for an indurated Gland in the Groin, the ointmt. is to be rubbed on the Legs; if in the arm pit, on the Wrists; or if in the Neck, on the Head &c. — Some Surgeons attempt the

Cure

of white swellings by the use of mercur.l ointm.t applied immediately on the Part, but from what has been said the absurdity of this may be easily conceived, and if any good effects can be derived from the use of merc.l ointm.t it must be applied as above directed —

The Lymph is forced on in its Vessels in the same manner as the Chyle in the Lacteals, i.e. by the action of y.e Adjacent Muscles, Vessels &c —

Mr. Baker one of y.e Surgeons to St. Thomas's Hosp.l received the Infection by opening a Bubo & at the same time having a small wound on his Finger, which after rec.g the Venereal Virus put on a very foul appearance & would not heal till he underwent a Salivation; it was attended with great Pain & Tension quite up to the axilla in the Course of the Lymphatics — Instances have been known of People receiving the Infection from kissing Women in the Streets who had the Disease; and in all these Cases y.e Glands of y.e Neck become swelled and a Rigidness may be felt in the Course of y.e Lymphatics which absorb the Virus from the Lips into the Neck —

Remarks upon Vision, from a Lecture of Mr. Warner –

Before we say anything of Vision it may be necessary to premise a little concerning Light: whatever Light is, we know that it moves in a Straight Direction quaqquaversum and will continue to move straight always, unless it meets with some Obstruction; the farther the Rays are from the Luminous Body the thinner, i.e. the greater Distance they must be from one another; and according to the Bodies which its Rays pass thro, or meet with in their Passage, they are either Reflected or refracted; the first happens when they fall upon a Polished opaque Body which they cannot pervade, hence such Bodies become Luminous and different Colours are produced according as the Parts are Capable of reflecting such or such particular Rays; Black only has no Reflection, because it absorbs all the Rays: if a Ray of Light meets with a polished opaque Body, it is reflected back again in the same Direction, i.e. if it falls perpendicular it is reflected in the same Direction; if with any degree of Obliquity, it is reflected with the same degree – Refraction happens when the Rays pass thro any fluid Body, except when they fall perpendicularly then they go on in the same Direction; when a Ray falls obliquely from a Rarer to a denser Body or Medium, as from Air into Water, it is thereby refracted & brought more to a perpendicular, but the contrary happens when the Ray passes from a Denser to a more Rare Medium, for Rays passing ~~from~~ obliquely thro Water into Air are thereby more refracted from a Perpendicular – From this Refraction a Convex Glass burns, by collecting the Rays together, for by its Density they are

the Situation of y^d. Eyes hardly need any explanation, there=fore shall only observe that they are Situated in two Cavities at the inferior Part of y^d. Forehead which are called Orbits and in which a considerable body of Fat is lodged which serves for the free motion of y^d. Eyes & to prevent those Injuries which they would receive from Blows & Frictions against the Bony Orbits —

Some Anatomists divide the ~~Eye~~ Organs into external & internal; others into the Globe of y^e. Eye & its appurtenances; which last I shall follow —

By the appurtenances, I mean all those Parts which some call external Organs of Vision, and are, the Super=cilia or Eye Brows, the Palpebræ or Eye-Lids, the Cilia or Eye-Lashes, Glandula Lachrymalis, Puncta Lachrymalia, and the Caruncula Lachrymalis, with the muscles of y^d. Eye &c —

and of these I shall speak first —

The Superciliæ are those arched Rows of Hair situated at the upper part of the Orbits somewhat raised & promi=nent by the great quant^y. of adipose membrane under them & under that there is a slender plan of muscular Fibres running transversely and are called Corrugatores Cutis vel Superciliorum; these muscles act when we frown —

refracted & collected to a Point at some distance from the Glass where they cross one another — By this Refraction of the Rays the objects become inverted, as the Picture of a candle passing thro a Magnifier will be found inverted on a Piece of Paper held at a proper Distance from the Glass: the same happens in passing thro the Crystalline Humour of the Eye, as we may see by cutting part of y^d. Coats of the Eye at the Posterior part and applying a piece of Paper in their Stead; the Eye then forms a true Camera Obscura. The anterior Coat of ye Eye is made transparent for the Passage of y^d. Rays, and also more convex than the other Parts that all the Rays may be collected to pass thro the Pupil: the Choroides is made vascular to nourish the whole & perhaps separates the fine Juices for the Support of y^d. Humour: the Iris is loose to allow contraction & dilatation to the Pupil and is properly suspended in the aqueous Humour without any impedim^t. to its action; the use of the Iris seems to be to shade the Retina from too much Light; if we observe a Person looking at any Luminous Body we see the Iris contract, whereby fewer Rays of Light can pass to the Retina; but when he directs his Eye to an opaque Body the Pupil is dilated to admit as many Rays of Light as possible; and the Nigrum Pigmentum is black, that no reflection may happen: the Retina is expanded upon the whole & is supposed to be the immediate organ of Vision — The aqueous Humour, besides supporting the Iris, begins the Refraction of y^e. Rays of Light which is after

wards.

The Use of yd. Eye-brows seems to be to break & Divide the Rays of Light and to prevent their falling perpendicularly from above upon the anterior part of yd. Cornea when we are looking at Objects directly before us, which would interrupt Vision & render the Sight of the Object we were looking at imperfect to us. they serve also as Diverticula to the Sweat preventing its geting into the Eyes which it would be apt to irritate & inflame from its acrid saltness — The ancients supposed the Eye-brows as useless or as placed here merely as an Ornament to the Face; however they are certainly very necessary & useful for the above purposes, and it is said that those whose Eye brows are but thinly covered wth Hair or who have white Eye-brows cannot see so perfectly as those who have large Eye-brows thick set with Hairs or who have dark ones and on this accot. it is customary in some Countries to paint the Eye-brows Black —

The Cutis & Cuticle are the same here as in any other part of the Body, but the membr. Cellularis is of yd. adipose kind being greatly loaded with Fat; and in this Respect it differs from the Cellular membrane of yd. Palpebræ, which is of yd. Reticular kind having little or no Fat, hence we see Extravasations of Blood from Blows or any accidental causes spread so far & quick abt. the eyes —

The Palpebræ are two in no. to each Eye, the upper & lower, and be ides being composed of the common Integuments above mentioned the upper have a slender plan of muscular Fibres which is the Termination of yd. Elevator Palpebræ Superioris proprius; under the Reticular membrane there is likewise a slender plan of

Muscular

=wards completed by the principal Refractor the Crystal-
=line; the Vitreous serves to keep the Retina allways expanded
and the Vitreous Humour always at a due Distance from
it for the Rays to be brought to a point on it: and on
this Refraction and collection of the Rays to a Focus on the
Retina does distinct Vision depend, and is brought about
by it; but as this always happens in the inverted order
as before mentioned, it may be asked why we see objects in
their proper order or Position when they are represented on the
Retina Topsytuvey? I believe this happens merely from use
& the assistance of our other Senses; and this seems to be the
case, because if we stand on our Heads, the objects ap-
=pear the same as when stand on our Feet, which could
happen from no other Cause —

The advantages we derive from two Eyes more than one needs not
be mentioned — The variety of motions given to them serve instead
of a greater no. of Eyes — and as in Vision it is necessary we
should exclude all objects but that we are looking at so Ex-
=perience teaches us to direct both our Eyes to the same Thing;
hence Children born with weak & bad Eyes commonly squint,
because the bad Eye is useless, and this kind of squinting
may be sometimes cured by covering the good Eye for some
time because that directs the bad one to the object & there
by improves or strengthens it; but this method requires a
great deal of Care & Caution — It may be asked why we dont
see objects double, as we have two Eyes? The same Reaction

muscular Fibres running Circularly which is called Orbicularis Palpebrarum and is common to both Eye lids; it is inserted tendinous into the Nose at the inner Angle of the Eye — The Elevator palpebr. Sup. prop. just mentioned is liable to relaxation & when relaxed the upper Eye-lid falls down over the upper part of yr. Eye & causes a partial Blindness — Internally the Eye-lids are lined with a fine Membrane which is a continuation of the Conjunctiva & not of the Cuticle as some say because it is very sensible & vascular which the Cuticle is not — Between this membrane & the muscle called orbicularis there is a hard ligamentous Substance of a Semilunar form which is very thin posteriorly but gradually grows thicker as it approaches to the Edges of the Eyelids where it is called the Tarsus which is properly a Ligamentous Substance & not Cartilage as it is said to be; in Cows & other large Quadrupeds it appears of a Yellowish Colour, but in the human Eye it is commonly white — The use of it is to prop out the Eye lids &c. keep their Edges regular & even & serves to adapt the Eye lids to the Shape & Figure of yr. Globe of yr. Eye —

The use of the Eyelids is obvious, they serving not only to defend the Eyes from external Injuries at all times but also by being almost in Continual motion they diffuse the Tears over the external Surface of y. Cornea by which means it is kept always moist & transparent which is absolutely necessary to Vision; and by their motion all extraneous Bodies such as Dust &c. is washed off —

The Cilia are two Rows of Hair placed upon the Edges of the Eyelids just without side the Tarsus; those Hairs situated on

the

Question may be asked of y.e Eyes why we dont hear two Sounds — Seeing is certainly learnt as the other Senses, and I believe Infants do not see Objects distinct but all in Confusion, till they learn to fix on them by degrees thro the Direction of y.e other Senses — I knew an Instance of a Boy of about 12 years of age who was couched for a Cataract; at first all was Confusion; I saw him 8 Days after, and then he could not say had of any object with Certainty; he could see it, but if he wanted to take any thing off the Table &c. he would put his Hand down at a Considerable Distance from the Object on the Table, but by degrees he learnt to fix upon it.

The Crystalline Humour being too flat is insufficient to bring the Rays of light to a Point soon enough; hence such Eyes are assisted by convex Glasses, which do not magnify the Objects as is supposed, but only assist the Crystalline to bring them to a point on the Retina. The contrary to this is that of Purblind Eyes in which on accot. of the Crystalline Lens being too Convex the Rays are brought to a Point before they fall upon the Retina, and these sort of Eyes are rather better than worse by age which brings the Crystalline to a more flattend Figure.

the upper Eyelid have their Points turned upwards, and those of the Lower downwards — They serve to break off any of the Rays of Light which may have escaped from above thro the Eyebrows, but they serve chiefly to keep off insects, as small Flies &c. & prevent them from getting into the Eyes —

If we look on the inner Surface of the Eyelids we may observe a number of white Lines running in a Straight Direction towards the Edges of the Eyelids; in large animals they are very plain; these are the excretory Ducts of the Ciliary Glands terminating on the inner Edge of ye. Eyelids from which there is an oily or rather thick Sebaceous matter lodged which is secreted by the Ciliary Glands, and which mixing with the Tears is said to blunt their acrimony & likewise to form a Varnish with which the Cornea is kept moistend & transparent; for was the Cornea to become dry, it would become not only painful to us, but in some measure lose its transparency: for this Reason it is that we cannot look earnestly at any object long together without moving or shutting the Eyelids in order to diffuse this Varnish over the Cornea — It is not unusual in Colds to find the Eyelids when we first wake in a morning closely united & sticking together, which is caused by this thick oily matter secreted in greater quantities & becoming inspissated in the Night forms a Cement —

The Ciliary Glands are very similar to the Sebaceous Glands of ye. Cutis and as we often see the inspissated

Fluid

Fluid in the Cast forming small Knots in the Face & other Parts, with a small Degree of Red ness & Inflammation, so in the Eyelids we often have the same appearance from the same Cause, for which authors recommend the Extirpation of one or more of the Cilia in order to make an opening for the Fluid contained within the Tumour to be evacuated; but if we consider that the mouths of ye. Ducts of ye. Glands are placed on the inside of ye. Tarsus and the Cilia are situated on the outside we shall find that no good can be derived from it but that it is prejudicial, tending rather to increase than diminish the Inflammation; and the best way of treating them is by the application of warm emollient Lotions &c. wch. will commonly cure in a few days —

Glandula Lachrymalis was by the Ancients called Innominata as they did not understand its use; for they thought that the Tears were secreted by the Caruncula Lachrymalis & for this Reason in old writers we find this Caruncle described for the Lachrymal Gland — It is a small Gland of ye. conglomerate kind situated in a Sulcus in the bony Orbit at the Superior Part of it near the external Canthus of the Eye —

The use of it is to secrete the Tears which are conveyed from it to the Eye thro' several Excretory Ducts which it has belonging to it; and tho' no anatomist doubts of the Existence of these Ducts yet they are very difficultly seen in the Human Body; they may be found in the Eyes of Brutes but not without some difficulty even in them — This Gland

is so situated as to be compressed by the action of the Orbicularis Muscle which acts when we are most in want of the Tears; this is evident from our moving the Eyelids when the Cornea has become dry from keeping the Eyelids asunder, in order to moisten it afresh, and by this motion of the Eyelids more Tears are pressed out of ye. Gland; and thus there is a continual supply of Tears — When we are asleep but few Tears are secreted, because the Orbicularis muscle is inactive & the Eyes are kept sufficiently moist by the Palpebræ covering it. We find this Gland tho' small is capable of secreting a large quantity of Tears whenever any extraneous Body has got into the Eye at which time the Tears are most wanting to wash out the Body; and Passions of ye. Mind are capable of affecting this Gland, thereby producing a very increased secretion from it —

The Angles or Canthi, commonly called the Corners of ye. Eye are formed by the Junction of ye. upper & lower Eyelids & are two, the external which is the Sharpest or most acute & the Internal which is nearest to the Nose and is wider on account of a little fleshy substance placed between the Eyelids in this angle, and is called Caruncula Lachrymalis —

Near the inner Canthus of ye. Eye on the inner Edge of ye. Tarsus are situated two little orifices one on each Eyelid opposite each other, called the Puncta Lachrymalia, which are the mouths of 2 Small Tubes serving to take up & convey all the Superfluous Tears into the

Lachrymal

Lachrymal Sac, which is a little Bag situated close to the Nose, from which a Canal is continued into the Nose called Ductus ad Nasum thro which the Tears pass into the Nose — Thus the Tears are first secreted by the Glandula Lachrymal. from whence they pass to the Eye and are then taken up by the Puncta Lachrymal. carried into the Saccus Lachrymalis and from thence thro' the Ductus ad Nasum into the Nose —

The Lachrymal Sac is a Small oval Bag situated near to the nose in a Sulcus in the inferior part of the Orbit; in young Subjects it is more prominent than in old, hence it will be more easily cut into in performing the Operation for the Fistula Lachrymalis — Immediately over the upper part of this Bag is placed the Tendon of q^d. orbicularis muscle which we are directed not to divide in performing the Operation for Fistula Lachrymalis, but it is of no Conseq^ce. whether it is divided or not, as it is my Opinion that an Inversion of the Eyelids &c. are not brought on by the Division of this Tendon but is owing to bad Treatm^t. after the operation with Escharotics &c. But there is no necessity for dividing it at all & it may be avoided by beginning our Incision into the Sac below the Tendon; in order to do which an assistant may pull the Eyelids

from

from the Nose by which the Tendon will be made to project and the Incision is then to be begun below it and a suffic.t distance from the Nose ——

The Carunculæ Lachrymalis is a small fleshy eminc.e situated between the Eyelids in the inner Canthus of the Eye — Its use is to keep the Eyelids at this place se — parated during our being asleep that the Superfluous Tears, if there are any, may not be obstructed or pre — vented from passing into the Puncta Lachrymalia —

The Muscles of the Eye are 6 in No. to each Eye, which take their Names from their different Actions, and are divided into Straight and Oblique — The Straight are 4 in No. arising from the Bottom of the Orbit and act as antagonists to each other; they are called the Attollens, Depressens, Abduc — tor & Adductor: the Attollens & Depressens are placed opposite each other one superior the other inferior & act as antagonists against each other; the Adductor is situat — ed laterally and draws the Eye to the Nose, & the Abductor is its opposite & antagonist — The Oblique are 2, the Obliquus Superior & Inferior; the Oblig. Superior arises from the Bottom of the Orbit & running to the inner angle of y.e Eye very near to the Bone, there passes thro a Cartilaginous Pully from whence it goes to be inserted tendinous near the Insertion of w.d Attollens —

The Obliquus Inferior arises near the inferior Edge of the Orbit near the Nose and running obliquely upwards outwards is inserted near the Tendon of the Abductor.
The names of these Muscles describe their uses; they all assist the Eye in performing a compleat Rotatory Motion tho the 2 last are the chief in doing this —
The Tendons of them are all inserted into the Sclerotica close to the Edge of the Cornea and their Expansion forms the Tunica Albuginea or white of ye. Eye, tho Some, & among these Dr. Hunter, describe this & the Conjunctiva together as only one Coat ~~under the Name of~~ Tunica Adnata; but as they may be easily seperated especially in Young Subjects they ought properly to be called by two distinct Names, viz, the Conjunctiva & ye. Albuginea.
The Figure of ye. Eye is supposed to be altered when all ~~these~~ the straight Muscles act together; that is, when a Person looks at any Object placed very near to the Eye, all these acting together draw the Eye deeper down into the Orbit and its Figure becomes more flattened —

The Adipose placed at the Bottom of the Orbit is rather softer than the Fat in other Parts of ye. Body & serves the Purposes already mentioned — It is often wasted by long Illness and hence the Eyes appear sunk deep in the Orbits; and sometimes it becomes diseased & prey to one

a fungous

a fungus fleshy appearance; this Disease is called a Cancer of ye Eye, and when very large ye Eye is turned out of the Orbit & the muscles put upon the Stretch which renders the Extirpation of ye Eye necessary —

Having seen all the diff^t Appendages of ye Eye we shall now proceed to the examination of ye Eye itself called the Globe. This is a very curious Organ & ought to be well understood by every Surgeon, but it too frequently happens that Surgeons for want of an anatomical knowledge of the Eye, are unable to treat ye different Disorders to which it is subject, and are often at a loss to account for the different appearances observeable in ye Eyes when they become diseased. It is owing to this alone that some of the most curious & ingenious Operations in Surgery have fallen into the Hands of Empirics & Venerables, who are not allways men of ye greatest Honesty & Learning —

The Anatomy of the Eye has been differently described by every Anatomist who has wrote or spoke of this Organ and it is partly owing to this, that its anatomy is so little understood, as they create a confusion by it; to avoid this I shall endeavour to explain it in the most plain & easy manner & make use of as few technical Terms and divisions in the diff^t Coats &c. as possible —

The Figure

The Figure of the Globe of yd. Eye is nearly Spherical but not entirely so, the anterior part of it being a little prominent representing the half of a smaller Sphere placed upon a larger one — It is divided into the Containing & the Contained Parts: the first are the Coats of which I shall first speak and then examine the Contained Parts, which are, the Humours —

The Coats then are 5 in number and are divided into 2 Partial & 3 entire — the 2 Partial are, the Conjunctiva & albugenea; the 3 entire are, the Scleroticka, Choroides & Retina — The Conjunctiva is the most external & the Retina the Internal —

The conjunctiva has already been taken notice of as being a fine membrane lining the internal surface of yd. Palpebra from whence it is reflected & lies loosely upon part of the posterior, all the middle & part of the anterior portion of yd. Globe of the Eye as far as the edge of the Cornea where it firmly adheres to it — There are several considerable advantages derived from this Reflection of yd. Conjunctiva; it prevents any Extraneous Bodies, that may happen to get between its inter surface & the inner one of the Eyelids, from slipping so far back behind the Globe as to render Extraction impracticable; for Instance if any Gravel,

or Dust

*. Young Children in the first months of their age very frequently are troubled with ~~the~~ an In=flammation of this membrane with a Discharge of Matter from the Eye when pressed, which some=times is so great as to threaten a Loss of the Eye. For the cure, Emolt. Cultices, Fomentations &c.

W. Warner.

I have seen several cases of this kind, ~~all of~~ which terminated happily, except one; in this, the Inflammation was so violent and obstinate that it was communicated to the Cornea here==pervous, upon which a Speck remained after the Inflam: was subdued — The best application seemed to be Collyriums of poultices of Goulards acetate — min.l water ——

Dust or Insect be got between the upper Eyelid & the Eye, it can pass no farther than the Reflection posteriorly, therefore if you direct the Patient to look down & you at the same time pull the Eyelid upwards, this membrane will be brought forwards & you may then see & easily extract the extraneous Body with the Point of a Probe, which is as good as anything, armed with a little soft Lint; if it is between the Eye & the lower Eyelid, direct your Patient to look upwards &c.

This membrane is commonly the seat of Inflammation* in the Eyes, such as happen from Cold or any such Cause, when its minute Vessels appear distended with red Blood, and if the Inflammation is suffered to proceed or continue for any Length of time the Inflammation may be communicated to the other Coats; hence an adhesion takes place, and therefore we are to endeavour to remove the Inflammation as expeditiously as Possible by frequ. & copious V. S. with Topical & General Evacuations, Fomentations, Poultices &c; for tho' the Inflammation may be removed after it has continued so long & violent as to cause an adhesion, yet an opacity or dulness of sight is brought on by this thickening of its Coats, which no art can afterwards remedy.

The Vessels of this Memb.e are very numerous & beautiful when

when injected with red wax —

The Albuginea lies next, immediately under the Conjunctiva and takes its name from its white appearance. We have already mentioned what this is * and as there is nothing remarkable in it, we shall go on with the Description of the next Tunics, the Sentire ~~y~~ take them in the order as they lie one above the other —

The most external of these is the Sclerotica which is a strong, thick & tough membrane; the middle & posterior part is opake, the anterior clear & transparent, and hence has been distinguished by the names of Cornea opaca & transparens; but we are to understand that it is one & the same Tunic under two different names; all that Part of it which is opake we shall call Sclerotis, & the anterior transparent part, Cornea. The Sclerotis is vascular tho' not so much so as the Conjunctiva; it is very hard, firm & thick at the posterior part of it where the optic nerve enters from whence it gradually becomes thinner as it approaches the Cornea: in most parts it appears streaked & of a brownish Complexion — The Cornea at its first commencement is very thin but becomes thicker as it approaches to the middle part of it, where it is equally transparent but much thicker,

* page

and

and it is this Thickness that forms the Convexity of the Eye, or that prominence before mentioned to be on the anterior Part of ye. Eye: it is composed of several different Laminæ which may easily be seperated from each other. It is said, there are a great No. of Pores in this Tunic thro which the aqueous Humour, which lies immediately under it, passes & mixes with the Tears, but this is only Conjecture & I believe is not true, for tho' in the Dead Subject the aqueous Humour will be lost in 24 Hours sometimes, yet it does not prove the Existence of these Pores, as the Humour may be and in all probability really is absorbed by vessels which perform Absorption during Life — The external Surface of the Sclerotic is smooth in every Part except where the Tendons of ye. Muscles are inserted into it: The Cornea is reckoned the smoothest membrane in the Body, and this smoothness is requisite & necessary, that the Rays of Light might Pass on without any Interruption thro it; for were there any roughness or irregularity on it, all objects would appear distorted more or less in proportion to the Irregularity; this is evident if we look at Objects thro rough or irregular Cut Glass; and in People who have Specks in or towards the middle of the Cornea from small Pox, wounds of the Cornea &c. this Circumstance allways turns out; Different Names have been given to these opacities of the Cornea, as the albugo, Ungula, proptosis &c & there have been instances where they have been removed by blood Ligatures

Levigated Glasses into the Eye twice a day mixed & triturated with the finest Sugar; but for y most part they for ever remain in spite of every thing that can be done; as a stronger Escharotic than the preceding cannot be used to this part — It is beyond a Doubt that the Cornea is vascular tho' its Vessels do not carry red Blood as that would obstruct Vision, but the strongest proof of it's Vascularity is its again uniting and healing after being wounded, which parts that are not vascular will not do, as the Nails, Hair &c — according to Haller the Cornea has very few Nerves sent to it, for he says, that it is almost insensible —

Old People losing the Convexity of y. Cornea are obliged to make use of Convex Glasses to supply the Defect, & again on the contrary, when there is too great a convexity of this Coat it renders people near sighted & such are obliged to make use of Concave Glasses; the Cause & manner in which these different effects are produced will be explained hereafter ——

The Choroides is the 2d. entire Coat of the Eye & lies immediately under the Sclerotis to y. internal Surface of which it is slightly attached by its Vessels piercing thro' it & ramifying on its Surface; we can trace this Coat from the Optic nerve, which it closely embraces & surrounds as it enters the Eye, to the Edge of y. Cornea where it very closely

where

adheres to the Sclerotica, and then seperates itself from it & hangs down in a Circular form loose & floating in the aqueous Humour dividing it into its 2 Chambers as they are called: here it loses its name & is called Iris, which is of different colours not only in different animals but sometimes in the same Eye, giving the different Colours to the Eyes of different People, as black, Grey, Blue &c; and it is likewise thicker than the other part of the Choroides, for which Reasons it is said by some to be a distinct Membrane from the Choroides; but I cannot by any means allow this to be true, for seeing that the Cornea is of a diff. appearance from the Sclerotica we might with equal propriety call them two distinct & seperate membranes, which no person say to be the case, and therefore I would have it understood that the Choroides & the Iris are one & the same membrane with this difference only, that all that part which lies under & is connected to the Sclerotica is called Choroides, and that part which lies floating in the aqueous Humour is called Iris. The Choroides is a fine thin vascular membrane; its Vessels creep along the sides of the Optic nerve & getting upon it, takes many vertical & winding turns upon its surface: the Iris is likewise vascular —

On the internal surface of the Choroides next the Retina there is lodged a large quantity of Black Paint or Matter, called Nigrum Pigmentum, which is found in all animals

Animals; but in Brutes it is situated on the external Surface of the Choroides between it & the Sclerotica; and all Animals which feed upon Grass or at least all those that are properly Graminivorous Animals, have the Choroides of a Green Colour, which enables them to see Grass with less Light & with greater facility than we can — This Green Colour is called the Uvea —

The use of the Nigrum Pigmentum in the Human Eye is to prevent the Rays of Light from being reflected back upon the Retina, which would have been the Case had it been white; as white reflects all Colours, which Black does not but has a power of absorbing the Rays of Light — If it had been white we should have had a double tho imperfect Impression of all Objects and our Vision would not have been so distinct as it is; and all Animals whose Choroides is almost white can see Objects as well in the Night as in the Day on acco.t of their having a Double Impression, but their Vision is not so perfect as ours —

The Iris is not an entire Membrane, but in the middle it is deficient forming a Small Hole or Perforation called the Pupil, thro which the Rays of Light pass to the Retina thro the Crystalline Humour wch lies immediately behind this Hole — In the Human Eye the Figure of y. Pupil is quite Circular, but in

different

different Animals it is of different Shapes, & best adapted to their different way of living in all Animals; Thus it is circular in Men, because this Figure enables us to see all Objects every different equally advantageously; and for the same Reason it is also circular in some Animals who are the Prey of others, as Fowls &c; but graminivorous Animals have their Pupils oblong & horizontal — whilst other Animals which seek their Prey upon the Ground and climbing &c. as Cats & all that Species of Animals which hide in the Earth, have their Pupils perpendicularly oblong which is most convenient for them to look upwards & downwards as their Prey offers —

We find in the Human Eye that the Pupil is not always of the same Size, for it has a manifest power of Contraction & Dilatation in proportion to the number of the Rays of Light thrown upon it: this alternate Contraction & Dilatation seems to be performed by the Fibres of the Iris running in different Directions, some appearing to run Circularly, others longitudinally — These Fibres are not to be seen but in Preparations of this Membrane; and some Anatomists on Acct. of this Action of the Iris have thought it to be muscular, whilst others deny it & say that it cannot be muscular because there is no Point for the ~~muscles~~

muscles

Muscles to act from or upon, which however is no argument as the same Objection might be brought against the Heart's being Muscular which nobody denies; but whether it is Muscular or not I will not take upon me to say —

The Pupil is observed to be most dilated when we are in a Dark Place where few Rays of Light enter, in order that it may take in as many Rays as possible the better to enable us to see in such dark Places; on the Contrary when we are in a light Place it becomes very small & contracted, in order to prevent too many Rays of Light falling upon the Retina which would make too strong an Impression upon it & render Vision imperfect, and this we may be convinced of by looking at the Sun or any luminous Body — This Change in the Size of the Pupil is not brought about Instantaneously from the one to the other, & this is the Reason why a Person going immediately out of a Dark into a light Place (& vice versa) cannot see till some little Time after: for the Pupil, whilst the Person is in a light Place, being small & contracted must have time to dilate itself sufficiently in the Dark & then objects appear visible to the Eye which were not so before the proper Dilatation of yd. Pupil: the same Change takes place on coming out of a Dark into a light Place, for the Pupil being greatly dilated in the Dark, the Light on acco.t of a great number of Rays being received into the Eye, is too powerful for the Retina to bear and causes the same Dimness of Sight as when

we

we look at the Sun; but after being in the Light for some time the Pupil has had time to contract itself to such a Size as will admit of a proper number of Rays to make us capable of Vision — and thus we acco.^t for People who have been long confined to Dark Places, as Dungeons &c. seeing Objects which are invisible to others at their first entrance into such Places —

It is very necessary that we should know whether the Crystalline Humour adheres to the Iris or not in the Disease called the Cataract, because when it does adhere, it is laid down as a Rule not to perform the Operation: and this we are discover by observing whether the Iris has this Power of Contraction & Dilatation, which may be discovered by keeping the Eyelids Shut for some time and suddenly open them in a light Place, and if there is no adhesion the Pupil will be observed to contract itself from being enlarged & dilated during the Time the Eyelids were Shut; if on the Contrary we find no alteration take place we may be certain that there is an adhesion & the Operation is then not to be performed —

At the Place where the Adhesion of the different Coats of the Eye takes place, viz, around the Edge of ye termination of the Sclerotis & beginning of the Cornea there is observeable a white Ring, which is described by authors as a Ligament & hence is called Ligament. Ciliare; but it is not by any means of the nature of a Ligament and is nothing more than a white

appearan-

appearance formed by the adhesion of the Coats of ye Eye in this part —

From this Plane there a great No. of small floating Filaments called processus Ciliares, running like so many radial Lines from a small Circle to a larger one: they lie upon Zonula which embrace the Circular Rim of the Chrystalline Humour — Some Anatomists have thought that they were Glandulous, but the general Opinion is that they are Vascular —

The Nigrum Pigmentum before spoken of is always found in greatest quantities near these Processes; and it is supposed that the Reason why it is so is, that it is to prevent the Rays of Light falling obliquely upon the Retina which would have created a Confusion in Vision — Some consider this Nigrum Pigment as a real Tunic, but it cannot with the least propriety be called one, because it may be easily washed off from the Choroides & will tinge the Water of a black muddy Colour —

The 3d & last entire Tunic is by much the thinnest of all the Coats of ye Eye & is called the Retina: it is continued from the Optic Nerve immediately under the Choroid as far as the Ciliary Processes and cannot be traced any further tho' some say it is continued over & gives a Coat to the Crystalline Humour —

It is supposed that this membrane is the immediate Seat of vision, that the Figure of every Object we look at is painted

in

in Miniature upon it & from thence conveyed to the Brain by the Optic Nerve —

Its Vessels are very minute; it receives two very small Branches of Arteries, one from the Choroid, and the other runs from the Center of the Nerve —

The Optic Nerve enters the Globe of y^e. Eye laterally & obliquely towards the Nose — It is more fleshy than the other nerves without the Cavity of y^e. Cranium — Some have thought that the Coats of y^e. Eye were an Expansion of this nerve & its Coats; that the Sclerotica was a continuation & Expansion of y^e. Dura-matral Covering of y^e. Nerve; the Choroides, of y^e. Pia matral; and the Retina, of the medullary part of y^e. Nerve itself: but Winslow denies this absolutely: the Structure & appearance of the Coats of y^e. Eye are very different from those of y^e. Nerve, ~~[illegible]~~ & the nerve itself, especially the last; which seems to prove that Winslow is right in contradicting the old opinion —

There remains one more Membrane to be spoke of which is observable in the Eyes of Fœtus's only, generally of about 5 mo^s. old. It is called membrana Pupillaris and covers the anterior part of y^e. Globe of y^e. Eye — It is said that Dr. Sandes 60 years ago saw it notwithstanding some have alledg'd it to have been discovered long since that time — It is thought to serve some purpose in defending the Eye of y^e. Fœtus, but its use is not well known.

Of the Humours of the Eye.

The Humours of the Eye are the contained parts, and are 3 in Number, the Aqueous, Crystalline & Vitreous. The Aqueous is so called from its being a thin watery clear & transparent Fluid —

The Crystalline, is so called from its resemblance to Crystal-Glass —

The Vitreous is so called from its resemblance to melted Glass, is of a Gelatinous Consistence, less solid than the Crystalline, but less fluid than the aqueous —

The Aqueous Humour is situated most anteriorly immediately behind the Cornea & next to this, immediately behind the Pupil, is placed the Crystalline w.ch lodged in a Bed in the Vitreous, which is the most posteriorly situated & occupies nearly 2/3 of the Eye. By this situation it is evident that the Rays of light must pass thro all of them to get at the Retina.

The Aqueous Humour is divided into two Portions called Chambers, by the Iris hanging down within it, and these are called the anterior & posterior Chambers: all that Space occupied by the Aqueous Humour between the Cornea & the forepart of w.d Iris is called the anterior, and that Space behind the Iris between it & the Crystalline Humour is called the posterior, and is the smallest

of

of the two. This Humour is said by some to be of a Spirituous nature & will not freeze; in this Country the weather is seldom so severe as to freeze it before it disappears, which it does often in 24 hours after Death, being either evaporated by transudation as some say thro the Cornea, or which is most probable being absorbed; but in yⁿ. more northern climates it is often froze.

The aqueous Humour, indeed all the Humours of yᵉ. Eye, is deposited by Vessels and there are no doubt absorbent Vessels to absorbe it again by which means there is a continual supply & circulation kept up; for it is supposed that if it were to stagnate long, it would become putrid —

The use of the aqueous Humour seems to be principally to defend the Crystalline from Injuries and to keep it in its place, and likewise to preserve the Convexity of the Cornea, for as soon as the aqueous Humour is discharged by any accidᵗ. &c. the Eye looses its natural convexity upon the Cornea which becomes loose & depressed and the sight becomes totally or in a great measure lost, till the aqueous Humour again accumulates & distends the Cornea to its former Convexity by which means Vision will be restored — A remarkable case of this sort happend to a Boy who had the aqueous Humour discharged by a Blow from a Cricket-Ball.

by which the Eye lost its Sight & Conversely till the Aqueous Humour again accumulated & distending the Cornea which was flaccid the Boy recovered his sight again — This proves the Circulation of this Humour — It will not Coagulate with ardent Spts, as the Liquor Pleuro &c. does —

Behind the Aqueous lies the Chrystalline Humour, it is inclosed in a fine membrane called its Capsule which is a continuation of the Tunica aranea of the Vitreous Humour: its situation as before observed is behind the Iris & surrounded by the Ciliary Processes; it is of a Lenticular Form, hence called the Crystalline Lens, rounded & convex anteriorly, and like a burning Glass refracts the Rays of Light & collects them into a Focus upon the Retina, for which purpose it is kept at a proper distance from it by the Vitreous Humour, in a Cavity in which, one half of it is buried; the other part is prominent beyond the Surface of the Vitreous — It is of different Colours & Consistence at different Ages in the same Person; in Children it is white i.e. of a more watery Colour, in Adults it becomes of a Yellowish Colour, and at last in People very far advanced in Years it becomes almost black; hence we may account for

the

the Complaints which old People make frequently of Mists appearing before their Eyes or of Insects, as Flies dancing before them, which in time proves a Blindness. It is said to be more fluid in Children than in adults.

This Humour is the Seat of that disease called the Cataract which is nothing more than an opacity of it & from which no age is exempt — I shall now only observe with respect to the Disease that some People who are afflicted with it can distinguish Day from night; and this imperfect Vision is accounted for differently by different Authors: Mr. Sharpe says that the Rays which pass to the Retina & cause this sense of light do not pass thro the Crystalline but obliquely on each side of it: but I am of a different Opinion, for I can't think that any Rays can pass this way on acct. of the situation of the nigrum Pigment. placed between the Ciliary processes, it seems more probable that it is owing to the diff.t degree of opacity and that in proportion to that the Rays pass immediately thro it more or less, seeing that this Power of distinguishing Day from Night is not given to all persons who have Cataracts, which it would be if Mr. Sharpe's supposition was true — There are diff.t methods of remedying this Disease of which I shall speak particularly when on the operations —

The

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The 3rd. and last Humour of the Eye is the Vitreous; its Situation is posterior & occupies the greatest part of the Globe of ye. Eye, giving it its Spherical Figure: it is inclosed in a proper membrane of its own, which from its fineness is called Tunica Aranea which can only be seen in water and is said by some to be cellular & that the Vitreous Humour is contained within these Cells. This Humour taken out of ye. Eye & suffered to stand 12 Hours will entirely waste away together with its Tunic, no Traces of which will be seen — This Tunic as before observed is continued over the Crystalline Humour giving it a Coat & by this means creating a slight Adhesion between the 2 Humours —

The use of ye. Vitreous is to keep the Retina expanded & to preserve the Crystalline at a proper Distance from the Retina that all the Rays of Light may fall upon it in a Point or Focus —

Of Vision —

Vision consists in the Union of all the Rays which come from an Object exactly in one Point on the Retina, and every Ray has its innate Colour which is represented on that Part of ye. Retina on which it falls; this Point or Union of all the Rays on ye. Retina is called ye. Focus by means of which, the Image of ye. Object is painted and the

Sense

Sense of it conveyed by the optic Nerve to the Brain: It is the Use of the Different Humours & Coats of y. Eye to collect these Rays together in such a manner that they may meet equally and form this Focus upon the Retina: and this is what we call distinct Vision; but if the Eye is so formed by Nature or altered in its Figure by Disease that these Radial Lines coming from an Object do not thus unite equally in one Point upon the Retina, then Vision becomes imperfect or Obscure; as in a Dark Chamber that has a Hole in it furnished w.th a Convex Glass, if the Paper that is to receive the Image of the Objects be either nigher to or farther off from the Glass than its Due Distance, the Representation thereon will be imperfect & confused, because the Rays are not brought to a Focus; w.ch if they had, the Objects would have been painted of their proper Shape, Figure, Colour &c.; it is just so in the Eye if the Crystalline Lens is too near or too far off the Retina; and this Fault may be either owing to the natural Formation of y. Eye as too great a Convexity or Concavity of y. Crystalline & Cornea, or to Diseases producing the Discharge of y. Aqueous Humour as from Blows &c. by which the Eye loses its Convexity & becomes flattened: either of these Cases will produce imperfect Vision; if the Eye is too Convex, the Rays form a Focus before they reach the Retina and this is the Fault of their Eyes who are near Sighted; on y. Contrary, if the Eye is too little Convex, then the Rays for want of being sufficiently refracted by the proper Convexity of the Cornea or Crystalline Lens do not meet soon enough

upon

upon the Retina, but fall upon it scattering & seperate & the same Effects produced as in the other Case, tho' the Causes are immediately different; this last is commonly the Cause of a Defect of Vision in Old People, and therefore they are obliged to supply the Defect by Convex Glasses, by means of which the Rays are collected & form a Focus on the Retina, and from this it is obvious that Spectacles help old People not by magnifying the Objects but by the above means; what still further confirms this, is that such People cannot read y^d. largest Print without Spectacles & yet with them they can read the smallest — People who are Couched for a Cataract have this same Defect, on account of y^d. Contraction or Dispersion of y^d. Crystalline Lens, hence they are obliged to make use of the assistance of Convex Glasses — Mr. Martin in these Cases recommends the Glasses to be made Lenticular, i.e. convex on both Sides as they would best answer to the Figure of y^d. Crystalline Lens, and on that acc^t. he apprehends they would be of greater utility — On the contrary those who have too great a Convexity of y^d. Eye are obliged to use Concave Glasses in order to lessen the too great refractive Power of the Cornea &c., or in other words, these Concave Glasses make the Rays diverge so, that the Cornea & Crystalline shall be sufficient just to bring them together again in such a manner that they shall not meet before they get exactly upon the Retina; and for this Reason such are helped by holding the object very near, for the Rays are then more diverged than when the Eye is farther off from the object —

Of the Course of the Arteries

The Structure of the Arteries has already been explained; I shall therefore now point out on the Subject before us their Course beginning at the Heart with the aorta & tracing all its principal Branches —

The Aorta arises from the left Ventricle of the Heart, mounts upwards and forms its Curvature — It is divided into Aorta Ascendens & aorta Descendens; all that Part of it between its Exit from the Heart till it makes its Curvature, or as some say, till the Subclavians go off, is called the Aorta Ascendens; and from its Curvature it takes the Name of Descendens and is continued down on the left of the Spine under ye. Peritoneum & Diaphragm, as soon as it passes the last of which it runs immediate upon the middle of the Spine till it arrives at the Loins where it loses its Name and divides into two Branches which are called the Iliacs; this Place is called its Bifurcation — The first Branch the aorta sends off is the Coronary artery; which we saw when upon the Heart, & therefore shall proceed to the next —

From its Curvature arise sometimes one, two, 3 or 4 Branches; these are the Carotids & Subclavians: most commonly there are 3 Branches, the left Carotid, and Subclavian

going

going off in seperate Trunks, and the right Carotid going off in one Trunk and sending off the right Subclavian. These Vessels are sent to the inside & outside of the Head, to the Neck, part of the Thorax, Arms &c — We shall first follow the Carotids —

These run on each Side of the Trachea in one Trunk as high up as the Os Hyoides where they divide each into 2 Branches one the external the other internal Carotid: the first sends off several small Branches to the Trachea, Thyroid Gland &c. the last sends off no Branches till it gets within the Cavity of the Cranium —

The first Branch sent off from the external Carotid, which we shall follow, is the Super-Gattural, which runs in an inflected Direction & is spent upon the Thyroid Gland, in its course to which, it sends off a few Branches to the Trachea.

The 2d. is the Sublingual which runs along upon the Horns of the Os Hyoides and is spent on the Tongue & other Parts adjacent —

The next is very small, called the Mapilla inferior, and is spent chiefly on the mastoid muscle —

The Mapilla Superior or Genial is the next & is a pretty large one: it runs over the Lower Jaw where it lies immediately upon the Bone, runs over the Masseter muscle in a winding or rather Zigzag manner, sends off a Branch to

each

each of the Lips which are called the Labial arteries, and then mounts upwards and is spent upon the inner angle of the Eye, and is called Angular artery —

This artery where it runs upon the Bone of the lower Jaw may be divided, when pressure will be sufficient to stop the Haemorrhage — In the Operation for the Hare-lip we divide the Labial Branches of it —

The next artery is the Occipital which gives off small Branches to the Mastoid muscle under which it passes near its Insertion into the Os Occipitis and under the Splenius, and is spent upon the Occiput, many of its Branches anastomosing with the Branches of the Temporal & the following.

The Posterior auricular is next and is a small Vessel so as hardly to deserve the name of an artery sometimes; it is spent chiefly on the Cartilages of yᵉ Ear, but some of its Branches anastomose with those of the Occipital and the Temporal —

The Internal Maxillary is situated so deep down that it can hardly be wounded but by Gunshot; it sends off Branches to the Teeth, to the Temporal Muscle, the Pterigoidei muscles, the orbit &c. and it sends off one considerable Branch to the Dura Mater which is the Principal artery this membrane has —

The external Carotid now passes up before y^d. Ear & when it reaches the Zigomatic Process takes the name of y^d Temporal; this divides into 3 Branches, the anterior, Middle & posterior. The posterior anastomoses with the Branches of y^d. Occipital & auricular; the anterior Branch is what is divided in bleeding in the Temples, and some of its Branches anastomose with other Branches of Arteries coming from the opposite

The Internal Carotids cannot be shewn but upon Preparations where the Cranium is opened & the Brain removed. & therefore I shall now go to the Subclavians which come next in order; and shall speak of y^d. Internal Carotids at anoy^r. Time —

The Subclavians; they take a winding Course outwards from their Origin, then pass under the Clavicle where they loose their name and are called Axill ary; they passes over the first Rib and lie immediately upon it by which means it may be compressed by pressure upon this Place. In its Course to the Axilla it sends off several Branches; the first is the Thoracic which is very small —
The next is a considerable Branch called the Vertebral, which runs along under the transverse Processes of the Vertebra of the Neck & passing backwards enters the great Foramen and having got within the Cranium anastomoses with the internal Carotid —

The Mammaria interna runs immediately under & across the Cartilages which articulate the Ribs to the Sternum & not as some authors say, under the Sternum itself, and passing near the Ensiform Cartilage is continued upon the Recti muscles (on their internal surface) of the abdomen and goes to meet & anastomose with the Epigastric —

The Carotid is next, which divides into 2 Branches, the posterior & anterior: the first sends off Branches to the neck in different Parts, and the anterior sends off Branches to the Thyroid Gland, Oesophagus, &c —

The Intercostalis Superior runs over the 4 first Ribs, and in some subjects is a Branch of the Internal mammary.

The Axillary Artery sends off many Branches, some of which take no name — The first remarkable one which it sends off is the External Mammary, called by some the Superior Thoracic; This Vessel not only serves for the nourishment of the Breast, but, in Women, as a Secretory Vessel; bringing Blood for the Secretion of Milk — It is the Branches of this Vessel that are divided in amputating the Breast; and it may not be amiss to observe that in proportion to the Ground the disease has gained in the Habit, the Hemorrhage will be more or less from them; for, in Cancers, the Vessels are generally much distended, and in this Case the Hemorrhage will be often very great; and therefore we may always, almost, form a Prognostic

whether

whether the Disease will be apt to return or not: when the Hæmorrhage is great, I have always observed that the wound did not heal, or if it did, the Disease made its appearance again soon in some other Part — The Cancerous Virus often corrodes these Vessels, and the Patient is generally worn away by degrees from their continual Bleeding —

The Humeral artery takes a winding Course round the Head of y. Humerus & is spent upon the Capsular Ligamt. & Deltoid muscle —

The Subscapular is sometimes a considerable artery & is spent upon the Muscles of the Scapula & part of the Pectoral —

The Axillary Artery having continued it's Course till it passes the Tendon of the Pectoralis major, there drops the name and commences Brachial — Then runs under the Deltoid Muscle and close to the inside of y. Biceps; at which place it lies close to the Humerus & is covered externally by common Integumts. only; it keeps the name of Brachial so far as it runs in one Trunk, and when it divides into two, it gives the Radial & Ulnar arteries. Before it divides, it sends off many muscular ~~Branches~~ and several Collateral Branches, which frequently anastomose with the Radial & Ulnar —

The Place of its Division into Radial & Ulnar is very various in different Subjects; sometimes it is below the Joint of the Elbow, sometimes at the Joint, or one, two, three Inches or more above it; in some Subjects I have seen it divide so high up as not to take the name of Brachial at all, i.e. it divided before it passed the Tendon of the Pectoral; in general however it more commonly divides below than above the Joint and passing in one Trunk under the Tendinous Fascia immediately sends off the two above mentioned vessels —

The Direction, Size & No. of y^d. Collateral Branches wch. run from above ~~[illegible]~~ the Joint to anastomose with the Arteries below, is very various; and this, together with the uncertainty of y^d. Division of the Brachial artery, renders the Operation for the Aneurism very uncertain: if the Trunk of the Vessel is tied & the Arm mortifies, it is owing to there not being a sufficient number of Collateral Branches to supply the arm below —

The Ulnar Artery immediately after its commencement sends off some Muscular Branches and one considerable Branch called the Interosseous which runs along upon the forepart of y^d. Ligam^t. till it arrives at the Quadratus muscle under which it dips down and goes to be spent upon the Back of y^d. Hand; the Course of the

Ulnar

Ulnar is generally deep down under the Muscles in the Direction of y^d. Ulna and sending off small muscular Branches to y^d. different muscles of y^d. arm till it arrives at the wrist; here it runs under the Carpal Ligament, tho' sometimes above it, and is spent upon the inside of the Hand & Fingers —

The Course of the Radial is more Superficial than the Ulnar being often covered by common Integum^ts. only, and running sometimes over & sometimes under the Carpal Ligament sends a Branch to the Thumb and is then continued a little forwards and makes a circular Turn from the Thumb towards the Little Finger it meets & anastomoses with the Ulnar forming the arterial arch in the Palm of y^d. Hand; from this arch there are generally sent 4 Branches which run in a Straight Direction to the first Joint of the Fingers one Branch to each, where they all divide into two sending off one on each side of each Finger to their Extremities where they are lost in the Integuments — This arterial arch is not always constant but wherever it is wanting the arteries still have a Communication only their anastomosing Branches run in a different Direction —

If the arterial Arch or the arteries at the wrist should be wounded which is frequently the Case, I would

recom=

recommend Pressure to be used to Stop the Hemorrhage in preference to the Needle & Ligature; because the Tendons being here very numerous you would be liable to take one of them up with the Vessel or by exposing them endanger bringing on Inflammation, Suppuration &c. if not the Loss of y. Limb; and in general Pressure alone will succeed by which we run no risque of the above dangerous Symptoms —

The Internal Carotids we have observed give off no Branches till it gets within the Cavity of the Cranium; as soon as it does this it sends off a Branch thro the Foramen opticum to the Orbit which passes out of the Orbit thro the Notch or Foramen on the Orbitar Process of y. Os Frontis & is spent upon the Forehead, some of its Branches anastomosing with the Branches of y. anterior Temporal —

The Carotids then divide and each sends off a Branch to the other forming a Communication between the two. The Vertebral as soon as they get into the Cranium unite into one which is called the Basilary; this soon again divides into two, each of which sends off a Branch to communicate with the Carotids, by which means there is a free Communication between all the four, and this is what Willis calls the four-fold Arch: from these 4 Vessels

and —

and their Anastomosing Vessels, the Brain is supplied with Blood; the Anterior & middle Lobes of ye. Cerebrum are supplied by the Carotids; the posterior Lobes, Cerebellum & Medulla Spinalis from the Basillary arteries — The Basilary sends off a few small Branches to the Dura mater & the internal parts of ye. Ear —

What is peculiar to these Arteries is, that when they enter the Cranium they make many Inflections & windings and are much thinner appearing like Veins more than Arteries — These Circumstances seem to be contrived by Nature to prevent the too forcible Circulation thro them on Accot. of the tender Texture of ye. Brain; for by their Thinness, the Coats are rendered weaker in their action and Consequently the Blood is propelled with less Force thro them than if the Coats were as thick as those of other Arteries of the same Diameters; and by their winding Course the Circulation is rendered more Slow —

We now go to the aorta Descendens: this is divided into its Thoracic & abdominal Portions; the Thoracic is that part which lies above the Diaphragm; the abdominal is the part from the Diaphragm to its Division into the 2 Iliacs —

The Thoracic Portion diminishes very little in Size in its

Passage, the Branches which are sent off from it being very Small — The first of which are distributed to the Oesophagus, Bronchia & Trachea, tho' these do not allways go from the aorta but sometimes from the Intercostales.

The Intercostals are so called on account of their running between the Ribs upon the ~~the~~ Intercostal Muscles: they run almost at right Angles from the Aorta, and as the aorta runs to the left of yd. Spine the Intercostals of the right side it is evident must be the longest — They do not run in the Sulcus observeable on the inferior Edge of the Ribs, but upon the internal Surface of yd. Intercostal muscles rather nearer to the inferior than superior Edge of each Rib —

In performing the Operation for the Empyema, two Cautions are to be observed, the one is, to avoid wounding these Arteries; the other to avoid wounding the Lungs — In order to avoid the first, Surgeons direct us to make our Incision as near the upper Edge of the inferior Rib as possible; but this method is attended with this Inconvenience, that the Matter discharging over the Rib so near its Edge will be apt to render it carious —

Several Branches are sent off from the Thoracic Portion to the Lungs & Heart ~~for~~ their nourishment; & also to the Oesophagus — The first goes off to the Lungs & is called Bronchial or Bronchian; those to the Oesophagus are called Oesophagean.

As soon as the Aorta passes below the Diaphragm ~~it's~~ its Abdominal Portion begins, and the first Branch it sends off is the Phrenic or Diaphragmatic which is spent upon the Diaphragm on its inferior Surface —

The next is a very considerable Artery, called the Celiac which soon divides into 3 Branches; the first of which is called the Coronary and is spent on the Stomach; the 2d. is called the Splenic & goes to the Spleen — and the 3d. is the Hepatic which is sent to the Liver for its Nourishment; in its course it sends off several small Branches to different Parts, the Gall-Bladder &c. and one considerable one to the Stomach called the Gastrica Dextra, and a small one which is likewise spent on the Stomach & is called the Pylorica which anastomoses with the Coronary in the small arch of the Stomach; the Gastrica Dextra runs under the Intestines & over the Pylorus and continues its course upon the great Curvature of yd. Stomach, its Branches frequently anastomosing with the Branches of the other Arteries of yd. Stomach —

The Splenic in its Course to the Spleen sends off Branches to different Parts, as the Pancreas, Stomach &c. It gives off one to the Stomach which is spent upon the left Extremity and called the Gastrica Sinistra in opposition to the gastric. dextra which runs from

the

from the right Extremity of the Stomach along the great Curvature towards the left extremity — a little farther on towards the Spleen some small Branches go off from the Splenic to the Stomach called Vasa Brevia —

The Stomach then we see has 4 principal arteries sent to it, viz, the Coronary, the Pylorica, the Gastrica Dextra, and Sinistra, besides the Vasa brevia —

The next Artery is the Mesenterica Superior; this is spent chiefly on the Intestines, going off in one Branch from the Aorta but soon dividing into several which have frequent anastomoses with each other before they arrive at the Intestines after which they are spent in very numerous Branches upon the Intestines; they all run before they get to the Intestines, between the Duplicature or Lamina of the Peritoneum called the Mesentery — The first considerable Branch it sends off is called its anastomosing Branch which passes between the Lamina of the Mesocolon and anastomoses with a considerable Branch of the Mesenterica Inferior.

The next in course are the Emulgents which

enter

enter the Sinuses of the Kidneys sometimes in one, two three or 4 Branches – From these sometimes a small Branch is sent off to the Capsula Renalis & is called the Capsular Artery –

The Spermatics go off next of which I shall speak when upon organs of Generation, and therefore I shall only observe here that they generally arise about midway between the Emulgents & the Mesenteric. Inferior –

This last generally divides into 3 pretty considerable Branches; the 1st mounts obliquely upwards & goes to meet the anastomosing Branch of yd. mesenterica superior: the next is continued to that part of yd Colon which runs in the left side of yd. Cavity of yd. Abdomen; and the 3d. is sent to the forepart of the Sacrum, the lower part of yd. Colon & upper part of yd. Rectum; the Branch which is spent upon the Rectum is a pretty considerable Vessel in the adult and lies in the way of being wounded in cutting for the Fistula in Ano if the Sinus runs high up and we follow it to the Bottom; therefore I would never dilate farther than I could reach with my

Finger

Finger, by which means as the artery is not very large low down on the Rectum we avoid a Hæmorrhage which may prove fatal if the Vessel is wounded high up; and the Patients always do as well with a small Dilatation as if the Sinus was dilated to the Bottom —

The next is the Lumbal which soon plunges under the Psoi Interni muscles & passing over the upper part of ye. Sacrum runs out laterally upon the fore part of the Pelvis & is spent upon the Muscles of ye. Abdomen; some of its Branches anastomose with the Branches of ye. Epigastric. Epigastr.

The last artery which the Aorta gives off before its Bifurcation is the Sacral, which runs along on the fore-part of ye. Sacrum —

The Aorta now divides into the 2 Iliacs; which run some little Distance and again divide into the External & Internal Iliacs —

The external Iliac passes along the fore part of ye. Psoas Muscle & thro' the Ligament. Poupartii & then commences Crural —

The internal Iliac dips down into the Cavity of the Pelvis and gives off several Branches, called the internal Pudendal which are spent upon the Prostate Gland, Vesicula Seminales, Bladder & to the Pudenda in Women –

It next sends off a large one which is called Glutea and which passes in the Sacro Sciatic Notch thro the great Foramen Ischii to be spent on the Glutei muscles –

It sends off anoth. called the Ischiatic [illegible] The Umbilical Arteries in the Fœtus are sent from the internal Iliacs –

The next, the external Pudendal, likewise arises from the Ischiatic in the Pelvis, and passing out of the Pelvis runs on the outside of it under the Sacro Sciatic Ligaments and over the great Tuberosity of y. Ischium, from whence it mounts upwards upon the forepart of the Pubis & is continued on the Dorsum Penis in men, in Women upon the Clitoris. In its passage it sends off Vessels to the Rectum called the Hæmorrhoidal.

The Obturator is the only Branch remaining to be described before we come to the Crural – It commonly arises from the Internal Iliac, near the [illegible]

place

place where the Umbilical Arteries of yd. Fœtus go off, but sometimes it is a Branch of yd. Epigastric; it passes thro the Hole which is observeable in the Ligament which fills up the great Foramen Ischii & is spent upon the muscles of the upper part of the Thigh —

Thro this Place where the Artery passes thro the great Foramen a Hernia sometimes passes as it is said, and called by Mr. Sharpe Hernia Foramenis Ovalis; an Operation is recommended in a Strangulation of it, but it is so hazardous that I believe few Surgeons would be bold enough to perform it —

The External Iliac passes along the Course of yd. Psoas muscle & under Poparts Ligament into the Thigh; just before it passes under the Ligament it sends off the internal Epigastric Artery which runs inwards a little & then turns upwards and runs along upon the Recti muscles of yd. Abdomen to the upper part of them where it meets with anastomoses with the Internal Mammary —

In the Operation for the Hernia Cruralis we are liable to wound this Artery if we divide the Ligam.t by cutting upwards; if on the other Hand, to avoid this Artery, we should cut thro the Ligam.t obliquely we are in danger of wounding the Spermatic Vessels; so that I would not recommend the Dilatation of the Ligament at all, but endeavour to return the Hernia by the use of Fomentations, Glysters &c —

Near this Artery goes off another smaller one called the Epigastric. externa, which runs obliquely outwards & anastomoses with some of y.e Branches of the Lumbal artery —

As soon as the external Iliac passes below the Ligament. popart. it is then called Crural, which runs over the Pubis and along the forepart of the Thigh a little Distance & then runs obliquely towards the Inside where it lies upon the Bone and at which place the Compress of y.e Tourneguet is applied in Amputations, and is continued in an inflected or winding Course into the Ham where it takes the name of Popliteal which name it keeps

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till it divides into the Posterior & anterior Tibial — In its course it sends off many muscular Branches to be spent on the muscles of ye. Thigh, and one to the Labia Pudendo in Women and to the Scrotum in Men called Pudend. external — It likewise in some Subjects sends off some Collateral Branches from above which anastomose with some of its Branches or again enter the main Trunk some distance below. The Poplitea gives off several small Branches to the Ligaments about the Joint and then soon divides into the Posterior & anterior Tibial —

The Anterior soon pierces the Interosseus Ligam. along the fore part of which it then runs & passing on the outside of the Leg runs over the Tarsus & metatarsus to the extremity of ye. Metatarsal Bones of the first & 2d. Toe where it pierces thro to the Bottom of the Foot & anastomoses with the Posterior Tibial forming an arch similar to that in the Palm of ye. Hand and from which, arteries go off to the Toes similar to those of the Fingers

The Posterior Tibial plunges under the Gastrocnemii muscles and runs on the Inside of the Os Calcis just above which, it lies close to the Tibia; after it passes beyond the Os Calcis it dips down into the Bottom of the Foot and divides into two Branches the external & internal Plantaris, one of which is spent upon the Foot, the other runs to meet the anterior Tibial as before mentioned to send off Branches to the Toes —

In its Course to the Foot it sends off one considerable Branch called the Fibular, which lies close to the Fibula at the usual place for the amputation of the Leg and on this acct. is very troublesome sometimes to secure from Bleeding: the best way to secure it is to pass the Concave part of the needle close to the Bone thro the Interosseous Ligamt. and to bring it back thro the Ligamt. again near to the Tibia & make the Ligature —

On the Female Breasts

The female Breasts are situated on the Anterior parts of ye Thorax resting upon the fifth Rib, one on each Side — This Situation of the Breasts is peculiar to ye Human Body alone for in Brutes they are always found on the abdomen —

Their Figure is somewhat resembling half a Globe; their Size different in different women & various in the same Subject at Diffnt Times — In Young Girls they are very small and scarcely more visible more than in the Male till puberty; they then grow & increase considerably till the Age of 21: they differ in Size likewise in proportion to the Corpulency or Leanness of the Person; they grow smaller as old age advances

Near the Centre on the external Part is a remarkable Prominence called the Nipple, round which upon a Circular plane are situated many little Eminences which seperate a Fluid to moisten the Nipple with — The Breasts are larger in pregnant Women & those who give Suck, as are likewise the Nipples; — it is like the Breasts covered with common Integuments, only the membrane here is of the Reticular Kind and in the Breasts of the Adipose; the Circle round the Nipple is called Areolus and is white in Children but ~~in adults~~ is

is of a brown Colour, and during pregnancy grows darker which continues during the Time of Suckling Children; in old People it is almost black — Internally the Nipple is composed of many lactiferous Tubes which are only the Excretory Ducts of y^d. Glandular part of y^d. Breasts by which the Milk which is secreted by the Glands is conveyed to y^d. Nipple: the Number of these Tubes is Various; in some Women I have seen only six, and in others 15 or 16; they have no Valves, tho^ some think they have in order to prevent the Milk from flowing out when the Ch^d. does not Suck, but we know when the Milk is collected in large Quantities it will flow out of itself; hence it is probable they fall into Folds when empty but when they again become distended if the Child is not suffered to Suck, some part of y^d. Milk will flow out —

The Breasts are covered externally by common Integuments having a large Body of Fat under them, and under this Fat is lodged the Glandular Substance, which Secretes the Milk and which may be easily distinguished from the Fat by it's white Colour, the Fat being generally of a yellowish Complexion here: The Breasts have Vessels &c. v^d. same as all other Glandular parts.

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the lactiferous Tubes have no direct lateral communications with one another, tho' they anastomose with each other by their small Branches, as is evident by injecting Quicksilver into them; for if you pour it into one Branch you will distend a great many; hence it is evident they communicate with each other in their Ramifications thro the Substance of ye. Breast; and it is common when a Tumour is formed in the Breast from an obstruction in one of these Tubes to hear it called an indurated Gland of ye. Breast or one of the Glands of ye. Breast swelled, which implies there are more than one Gland in the Breast, but this is improper, because there is only one glandular Substance from which all these Tubes arise seperately —

The Vessels sent to the Breasts are the external & internal Mammillary; the external is principally bestowed upon the Breast, but the internal sends only a small Branch to it, the rest of it being spent upon the Intercostal muscles &c. — The Veins are the same as the Arteries —

There is a great Sympathy between the Uterus & the Breasts; for Instance, during the Catamenia the Breasts swell, and we see ye. Secretion of Milk only whilst the Uterus is in a gravid State or in such Women as give Suck who seldom or never have

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the Catamenia during that Time; and the Diseases of ye Uterus commonly cause a Disease in the Breast & so vice versa; for when there is a Scirrhus or Cancer in the Breast the Virus is generally communicated to the Uterus: but how these Effects are produced is not well known, or the Secretion of the Milk either: some would account for them by the communication there is between the Epigastric & internal mammary; but tho' these do communicate their Branches are very Small and unable to carry on so large a Secretion; for most of the Vessels sent to the Breast are from the external Mammillary; and they suppose that the Pressure of the Uterus in the gravid State forced a greater quantity of Blood into Mammillary Arteries which caused the Swelling the Breasts & afterwards the Secretion of the Milk in them; but the absurdity of this Reasoning is evident — men are frequently found to have Milk in their Breasts, hence it is highly probable that the Milk is produced by some other Cause than the Pressure of ye Uterus, and with which anatomists are not at present acquainted with; at least no Hy = =pothesis has yet been advanced but what may be overset by Objections which may be readily made against it —

It is a very bad method to use Repellents, as Diachylon Plaisters &c. to the Breasts of Women after

Delivery

N.B. At the Time the Breasts are forming in young Women from about 13 years of age to 16 or 17, it is not uncommon for them to have a small hard Knot generally situated near the Nipples which sometimes is attended with a good deal of Pain and may be mistaken for an incipient Cancer and treated accordingly; but these Knots are of no Conseq.ce & will generally disappear when the Breasts are perfectly formed, and ~~sometimes~~ the Patient may in the mean time take some opening Med.ne now & then & wear a mere.l Plaister on the part. In these Patients the Menses are generally obstructed or never have appeared, which was the Case in a Girl of 17 years of age who had one of these Knots near the Nipple which gave her much Pain and for which she came to the Surgery of St. Tho.s to ask advice: Mr. Martin looked at it and immediately pronounced it to be one of those kind of Knots and directed her to take

Delivery without the previous use of Opening Medicines internally; this is said to be often done to Stop the Discharge of ye. Milk, but very bad consequences often follow it; for at this Time Women are very liable to take Cold and the Milk Stagnating in their Breasts causes Indurations which frequently turn out an obstinate Schirrus, and if there is any cancerous Virus in the Habit at the Time it falls upon the Breast and produces an incurable Cancer; and at best after treating it with it with emollient Cataplasms &c which cannot be too much recommended in these Cases, a Suppuration is brought on and they will be longer or shorter Time getting well in proportion to the Depth of the Seat of ye. Matter: In these Abcesses nothing can be applied with so much Benefit as warm emoll.t Cataplasms, and they ought never to be opened with a Knife or Lancet but suffered to burst of themselves. Dr. Huch during the late War in America used no other method with the Soldiers Wives, and notwithstanding the Hardships they underwent during the Campaign they all did well; notwithstanding they were obligged to make use of Water instead of Milk in the Poultices — Observat. — It is really painful to witness (as I have done in many cases) the horrid mischiefs arising from a different mode of treatment — Incision following incision; Tent after Tent; acrid, sharp & corrosive Injections; together with Calomel & other Preparations of mercury

some gentle Purges every now & then & to wear a mercl. Plaister on it and in order to promote the Flux of the Menses directed Pediluvium on. Noctes. He said he had seen several young women who had the same Complaint; and in one Young Girl he was called to consult with a Man who ~~he~~ was a Cancer Cureer & had pronounced it to be a Cancer and intended to have applied his escharotic powder, but when Mr. Martin saw the Breast he undeceived the Parents of the Girl by telling them what the Case was, ~~and~~ the Em=
=piric was dismissed, and the Knot disappeard without the Girl's having the Pain of its being destroyed by the escharotic — He said that it is sometimes found in Breasts of young men just before they arrive to years of Puberty —

of Mercury given internally. Of this Mrs. Wm. Rowzie is one remarkable instance — and the Lady of a Genl. of Note in Carolina another. The latter Case hath almost had her constitution ruined by the treatment just described; in which the Calomel was given so as to salivate. In both these Cases I was called in just in time to save the parties suffering from further misery & pain, & to prevent the utter ruin of their health as well as the entire destruc=
=tion of the Breasts, by recommending milk, lenient applica=
=tions, with Bark.

The Course of the Veins

The larger Veins generally take the same Course as the Arteries and sometimes the Same names; therefore I shall not trace them from their extreme Branches towards the Heart nor dwell particularly upon them, but only mention the principal —

As we reckon'd only 2 arteries, viz, the Aorta & Pulmonary, so we shall reckon only three Veins; these are the Pulmonary, Vena Cava & the Vena Portarum: the first we have seen when upon the Lungs — The Cavas which are called Superior & Inferior I shall trace with their Branches from their Trunks to their Extremities which is the Reverse of the Circulation in them, and such as accompany the Arteries & take the same name I shall take no notice of —

The Cavas attend the Aorta thro the Cavities of the Thorax & Abdomen: the first Branch the Cava Superior sends off is the Vena Azygos, sometimes singly, sometimes in two Branches —

The Super. Cava soon divides & sends off the two Subclavians; the right Subclavian divides under the Clavicle and is then called Axillary; the left

Subclavian

[illegible] great [illegible]
[illegible] worthy;
[illegible] of which time it had worked [illegible] times
[illegible] neighbours
[illegible] prevented from having [illegible]
[illegible] by [illegible]
[illegible] with contempt.

Subclavian is longer than the right and gives off three Veins, the external & internal Jugulars & the Vertebral: The external Jugular which is the smallest is the Vein we open when we bleed in the Neck; the Divisions of yt. right Subclavian is the same; tho' there is sometimes a Variety here —

The Axillary divides into two Branches at the Head of yt. Humerus; these are commonly called the Cephalic which is superior, and the Basilic the inferior; these send off many cutaneous Branches as they pass along and form one considerable one frequently in the middle lying superficially over the Tendon of yt. Biceps in the Cubit called mediana from its situation between the Cephalic & Basilic: there is such a variety in their Branches that we may never meet with two Subjects alike: the Basilic is commonly the largest; their Branches frequently anastomose with each other & grow smaller as they approach the Fingers —

The Cava inferior when it gets into the Cavity of the Abdomen, sends off its first Branch the Phrenic, others to the Kidneys, Liver, ~~Lt~~ &c. all of which take their Names from the Arteries they accompany;

the Cava getting into the Pelvis divides at the same Place the Aorta does and takes the names of Iliacs like the Iliac Arteries, and are divided into extern^l & internal, and pass out with the Arteries under the Ligam^t Poparti, commences Crural, passes along with the Crural artery into the Ham and is there called popliteal which divides into many diff^t Branches which are distributed to the muscles of ye Leg, Foot &c and likewise sends off several Cutaneous Veins, the principal of which is called the Saphena which passes along upon the lower & forepart of the Tibia gets upon the Foot & is there lost — we should avoid wounding this Vein in making Punctures above the Ankles to discharge the Water in an Anasarca as every drop of Blood is of great Consequence to Dropsical Patients, & we may easily avoid it making the Punctures not too near the Tibia —

On the Common Integuments.

By the Word Integuments is meant a Covering for the other Parts; old Authors differ in their Acco.ts of these; some asserting there were five proper membranes included & meant by the Name of Integuments viz, the first, the Cuticle; 2.d Rete mucosum; 3.d Cutis; 4.th; Panniculus Carnosus; 5.th membrana Cellularis: this last is by present Anatomists considered as a component Part & as such it was described in y.e beginning of this Course of Lectures; and what is called Pannicular Carnosus is only a thin Plane of Muscular Fibres running along y.e ~~Cutis in~~ Quadrupeds, by the Assistance of which they are able to shake off any thing troublesome on their Skins, as Dirt, water, Flies &c. by these muscular Fibres acting & corrugating the Skin; and some Animals as Dogs & Horses have these Fibres much stronger than others; the Porcupine also has them exceeding strong by which means they are enabled to dart their Quills some Distance with very great Force: we might be led to imagine that such a Plan of Fibres existed in the human Body from many Parts having this Power of moving the Skin as the Lips, Forehead &c. & what bears a stronger resemblance, the thin plan of muscular Fibres in the Neck called Platysma myoides; but this as well as the Frontalis in the Forehead we call a Cutaneous Muscle, and do not allow the Existence of this Pannicular Carnos. in the human Body, tho' these Cutaneous Muscles bear a great resemblance to it & answer similar purposes to us: therefore we shall consider only three parts as making & composing the

Integum.t

Integuments, viz, the Cuticle, Rete Mucosum, & the Cutis —

The Cuticle or Epidermis is what Nature has given us for an external smooth Covering, very thin & finely polished: it is thickest in those parts where the greatest Friction is, as in the Palms of the Hands of hard working People, Smiths' for Instance, who have it so thick in their Hands as to be able to hold hot Iron for some time with little Inconvenience which would burn anoth. Person whose Cuticle was thin; in People who walk much we may cut into the Heel or Ball of yr. Foot ½ an Inch or more & no Blood follows or Pain felt; for it is not Vascular, and on that Accot. if Divided will not again unite, but a new Body is formed by yr. Vessels sent to the Cutis — it is softest where it is kept moistened and no Friction upon it, as in the Face between the Fingers &c — In Blisters we destroy the Cuticle & Rete Mucosum, but Nature soon regenerates a new one — How the Cuticle is formed has been variously conjectured; some have supposed it formed by a Fluid sent from the Cutis & being exposed to the air is inspissated & hardened by it; this Doctrine may be confuted at once by observing that the Cuticle exists in the Fœtus in Utero; some say it is formed by a number of Scales — but at present no Satisfactory Hypothesis has been Started — If the Cuticle is stripped off from the Cutis, the last becomes exceeding Sensible & the least & most gentle Touch creates pain, which shews that the Cuticle was designed as an external Defence to the Tender Cutis which would have

have been too irritable & sensible without it, and instead of the Touch conveying a pleasing Sensation to us, the Feel of ye Softest Body would have given us Pain —

The Hair is considered as an appendage to the Cuticle, as is likewise the Nails — The Hair is Vascular and its Vessels contain a Fluid for its Nourishment; sometimes this Fluid is dryed up & the Hair becomes dry & falls off for want of it, & thus the good Effects of Bears Grease & other unctuous Bodies are accounted for in recovering the Beauty of ye Hair, serving the Purpose of ye above oily Fluid — At the Root of every Hair is Seated a Smale Gland which is supposed to be the Seat of ye Tinea or Scald Head — The Colour of ye Hair varies in different People & in Different Climates — It is said to serve as a defence against Cold & other Injuries, on the Head; and also as a defence against Friction — It is in largest quant. on the Head, ye Pubis & under the Axilla; tho there is some in every Part of ye Body to prevent Excoriations of the Cuticle from Frictions against our Cloaths &c —

The Nails cannot be injected, which proves they are not Vascular, tho they seem to be nourished in the same manner as the Cuticle — their Situation we are well acquainted with — The Nails we find are continually growing, but notwithstanding, if one is Divided it will not unite, but the divided part will in time be shoved off by the Succeeding new one — Some Surgeons have thought the Nails to be continuations of the Tendons, but the one can be proved to be Vascular, the other not, and therefore this Opinion cannot be true —

The Rete mucosum is the 2d. Covering and from its Similarity from Experiments to the Cuticle it is called a second Cuticle adhering very closely to the first, from which it cannot be Seperated without great care & difficulty — It is said that the Colour of this Membrane constitutes yt. Difference between the African & European; but by experiments both it & the Cuticle have an equal Share in causing the different Colour, for we see the Palms of yd. Hand of a Black grow white by Friction, hard Labour &c — Some have said that the Rete mucosum was tinged yellow in a Paundice; if we admit this, it must be allowed to be Vascular, but the preparations of it shew that it is not in the least Vascular any more than the Cuticle — It is observed that the hotter the climate is, yd. deeper will be the Colour of these Tunics; thus in France, Italy, Spain & Portugal, they are yellow; in Africa, black; in Germany rather darker than in England &c —

The method of Seperating these Tunics from the Cutis is by throwing a piece of Integumt. into Boiling water & then Seperate the Cutis from them, and afterwards by maceration the Rete mucosum will peel off from the Cuticle —

Immediately under the Rete mucosum lies the Cutis: it is this Tunic in Quadrupeds with which Parchment is made — Haller says it is only the

Cellular

cellular Membrane more compacted; but I am of a different Opinion — The Cutis is elastic and exceed Vascular, being formed of arteries, Veins, Nerves, Lymphatics — All Tumours and abscess prove its Elasticity which expands it, and as the Tumour lessens or when the abscess is opened, it has a power of contracting itself again to its natural Appearance; the contractile Power is very evident in the Scrotum in the Hydrocele. The Cutis, like the Cuticle is thinnest where the least Friction is used &c. &c. it has two Surfaces, the external & internal; the External or that which is next the Rete mucosum is endued with great Sensibility from the least Touch, which is said to be owing to the Nerves terminating upon it in blunt Points called Papillæ pyrammidales — These Papillæ are endued with the Sense of Feeling in all Parts of the Body; they are very numerous on the Apex of ye. Tongue whereby some the Sense of Taste is principally placed; and they are also very numerous at the Extremities of ye. Fingers & Toes which appear by maceration to have a double Row of them, and also upon the Glans Penis; an artery Vein & absorbent may be traced going to them. The Vessels of ye. Cutis are supposed by some to be Serous; others, Sanguiferous & Lymphatic — The Colour of ye. Part depends the No. of Sanguiferous Vessels sent to it; thus the Cheeks are more or less Pale in proportion the number of ye. Sanguiferous Vessels: in Emaciated People and after Death the Face changes to a pale Colour; and we see that the Circulation in these Vessels is affected very much by Passions of ye. Mind, as Fear, causing Paleness; Shame

great

great Floridness, called Blushing &c. tho' this Happens Differently in Different People; thus, in some Anger causes a redness, in others Paleness &c — if you make an Incision into the Cutis you have first a Discharge of ~~Lymph~~ Blood, then of ~~Blood~~ Lymph &c.

Authors describe two Orders of Glands belonging to the Cutis; the 1st called Miliary from their resemblance to Millet Seeds; and the Sebaceous or fatty Glands which are principally situated about the Ears both behind them & on the Inside; but they are properly Follicles or Reservoirs containing a kind of dewy matter which exhales & serves as a preventative to the air affecting the Cuticle by keeping this last always moist: for was the Cuticle to become dry as happens sometimes in hot weather from this mucus being dried up or exhaled by the Heat of ye Sun faster than it is secreted, it gives us a painful Sensation upon the part: and this is what ye common People call Sun-burnt: and we find by rubbing the Part any Oily matter it softens the Parts & the uneasiness goes off: the same happens after Shaving in Cold weather, when if we go into the Cold air immediately after it, the Face smarts, & will often become chopped as it is called, which is nothing more than the ~~mucus~~ being shaved off the cuticle becomes Dry & cracks, but by rubbing it & warming the Face the Glands secrete more mucus & the smarting ceases — this Oil or mucus often inspissates in the Follicles of the Cutis

and

from little Abscesses, commonly called Worms, which are most frequent in the Face — They are to be cured by emollients & keeping the Face clean Shaved &c —

The Cutis has a No. of Pores or Foramina thro which exhales the insensible Perspiration which is now proved to be general throughout the Surface of y. Body; In warm Climates it is discharged in much greater Quantities than in cold northern Countries: Exercise increases this Perspiration, and the Contrary happens to those of a Sedentary Life; when the Perspiration is checked moderate Warmth & plentiful Diluting Liquors promote, on the contrary cold weather checks it very much — The capillary Arteries sent to the Cutis are so very minute that they cannot be seen but in ppr.s and we are told that they send off this perspirable Matter thro' the Foramina or Pores per Saltus: there are another order of Vessels very numerous upon the Surface of y. Cutis, and these are the absorbents which are the Lymphatics: the exhalling Vessels of Perspiration are called the Exhalents, and the absorb.t Vessels or Lymphatics are called Inhalents — The use of mercury rubbed on the Skin in the Cure of y. Lues Venerea daily proves the Existence of the absorbents or Inhalents; and likewise a Person bathing in Warm Water shall absorb a quantity of y. Moisture from the Water, as we see by ~~his~~ making a larger quantity of Urine & oftener than he commonly does out of it — Sweat is nothing more than an increased Discharge of this

their insensible Perspiration — After the Sweat or Water perspirab. gets out of these Pores it mixes with the Mucus in the Follicles which renders it accordingly more greasy in some places than in others, as the mucus is of different Consistences & nature in different parts of the Body; it is more greasy behind the Ears & under the arm pits than in other parts of ye. Body, therefore we find that the Sweat is more unctuous and of a different & stronger Smell —

The Tongue is the principal Organ concerned in Taste & forming the modulation of ye. Voice, as well as assisting the Aliment in its Passage to the Oesophagus &c — There are a great No. of nervous Papillæ on ye. Apex of ye. Tongue, and hence it has been generally allowed the chief Seat of ye. Sensation we call Taste — It is divided into its Apex, Edges, lower Extremity commonly called its Root, and the Basis — It is composed of many muscular Fibres running in many different Directions so that it is impossible to trace them far into its Substance; Several muscles are concerned in forming the Tongue, as ye. Genio-Glossi, Stylo-Glossus, Basio-Glossus; which serve to move it in different Directions — it is covered by a thick Spongy Coat which is a Continuation of ye. Cuticle and is called Epiglotta. on its Superior Surface it has a great No. of Small Eminences which are largest towards its Root where they are called Papillæ Capitatæ, and there is one large one called the Foramen Cæcum: out of all these Papillæ oozes out a mucus which serves to Lubricate the Tongue &c — hence they have been considered as Glands; oftentimes this mucus in some places inspissates and fills up the Foramen Cæcum at the Root of ye. Tongue & is mistaken by Surgeons for an Ulcer of ye. Tonsils; but it may soon be distinguished by arming a Probe & wiping off the mucus and washing it with detergent Gargarisms &c — The Basis of ye. Tongue is attached to ye. Superior part of ye. Os Hyoides, and what are called Ligaments of ye. Tongue are no more than Continuations of ye. Cuticle loosely upon these Parts; the Ligament continued under the

Tongue near its Apex is called the Frenum and is only a continuation of its Coat, when it is continued quite to the Extremity of ye. Apex it binds down the Tongue, prevents Mastication, Speech, & in Children sometimes, Sucking &c. and is called Tongue-tyed, which is remedied by dividing it with a Knife or pair of sharpe pointed Scissors, avoiding two small arteries which run upon the inferr. Surface of ye. Tongue on each side the Frenum — wounding of which might bring on a troublesome Hæmorrhage; wh. if it should happen the Child should not be put to Bed or suffered to Suck soon after, least he should be suffocated by the Blood — The Vessels of the Tongue are continuations of ye — Branches of the Carotids (internal) running over the Os Hyoides: it hew an Artery on each Side called Sublingual — The Veins are pretty large, lying deep under the Cuticle, and are very Visible on the inferior Part where they are ordered to be opened sometimes in Anginas, & with Success — it receives 2 Branches of Nerves from the 9th. Pair on each Side of it, many of which are said to terminate in the Papillæ Pyramidales at the Apex of ye. Tongue which after a minute Injection look red, therefore it is probable they each of them have an Artery Vein & Nerve sent to them —

The Lips are covered ~~by~~ externally by Cuticle, Cutis & Cellular membrane; internally by Cuticle only; under it the muscular Fibres belonging to them — if we maceratе them & examine them afterwards with a Glass we find a great no. of little Bodies continued under the Papillæ Pyramidales, by some called Glands, of a fatty appearance, and authors assert they have

Excretory

excretory Ducts which are continually distilling a Mucus into the Mouth; I have often searched for these Ducts but never could discover them, therefore cannot determine whether they are Glands or only Continuation of the Cellular membrane. The Ligaments of ye. Lips are the same as those of ye. Tongue, viz, a Continuation of ye. Cuticle —

The Gums are hard elastic Bodies surrounding & helping to fasten the Teeth in their Sockets; they appear very vascular when injected, and are said to be covered externally only by Cuticle — They become greatly affected by mercury, and are often attacked by the Scurvy —

The Bony Palate is covered by the Velum Palati, which is in part bony & in part Tendinous; under this covering is continued a part of ye. Cribrey Memb. of ye. Nose; and between these are a No. of little Eminences called Glands having a fatty appearance, tho they are not so distinct as in the Lips; supposed to secrete a mucus for lubricating ye Parts — The muscular part of ye. Velum Palati hangs down backwards & is called the Uvula, hanging down & forming a considerable Projection immediately over the Pharynx & has some Share in modulating the Voice, as is evident in Venereal Patients, who, when this is diseased or ulcerated have snuffling —

The Tonsils are two Glands placed at the Root of the Tongue opposite the Uvula which rests between them when the mouth is shut — They are a Series of Tubes, from which mucus is continu-

-ally

continually distilling & passing laterally to besmear the alim.
as it passes into the Oesophagus — These are liable to become
greatly enlarged so as to require the Extirpation of them &c —

The Cheeks like the Lips are every where covered by common
Integum.ts externally & are muscular; internally by cuticle
under which are a great many glandular Eminences as in the
Lips which serve the same purposes —

There are three Species of Glands called Salivary, which
are the Parotid, Submaxillary, & Sublingual — tho' I
believe the two first Secrete Saliva & the other I take to be only
a mucus Gland —

The Parotid is a fine Instance of yd. conglomerate
Kind similar in Colour & Structure to the Pancreas.
it is situated behind the Process and upon the Superior Con
=dyl. of yd. lower Jaw placed upon the Tendinous & upper
part of the Masseter muscle, which is wisely contrived
by nature, for had it been placed upon the fleshy part
of yd. muscle it wond have obstructed the action of the
muscle in mastication & the Saliva wond have been
obstructed in its Passage thro the Duct into the mouth,
but now the Tendinous part of the muscle pressing upon the
Gland during mastication which is the Time the Saliva is
most wanting produces an increased Discharge from it.
It receives its arteries & veins from a no. of small Branches
in the

in the adjacent Parts as the Pancreas does, for neither of these Glands have a proper Artery of its own sent to it — its Excretory Duct is a ramifying Tube made up of a no. of smaller Tubes, it runs over the Masseter Muscle & pierces thro the Buccinator near its middle is then continued a little forwards & opens into the Mouth between the 2d. & 3d of ye. Dentes Molares of the upper Jaw, at which Place there is prominence which will point out its Entrance. In wounds & abcesses of ye. Cheek we ought to be well acquainted with the Course & Entrance of this Duct, as wounding it would be attended with disagreeable circumstances on accot. of the Saliva discharging itself continually down the Cheek; therefore in opening abcesses or dissecting Tumours from this part of the Cheek, I would advise the Passing the Stilet of a Catheter into the Duct thro the Orifice which opens into the Mouth & keeping it there during the operation which will guide the Operator to avoid it.

Surgeons frequently speak of ye. Extirpation of this Gland & have constructed a Bandage for the Operation; but I am of Opinion that this Gland is not so often diseased as they commonly suppose; we often meet with abcesses & Induration upon or near it, which are mistaken for an Enlargement of the Gland itself — and if we consider that in removing this Gland we run a great risque, and indeed it is almost unavoidable, of wounding the Carotids, I think no Person would attempt it; for tho' no very bad consequence

might

might follow the wounding the external Carotid yet a division of ye internal one would prove almost Instantaneous Death; and the Surgeons who talk so freely of this Operation never mention as Mr Cooch does, the very troublesome Circumstance that occurred to him in extirpating a small part of this Gland, viz. that of ye Saliva pouring out in large Quantities down the Cheeks: this is a proof y^t it was only an Induration of some of ye Lymphatics near the Gland, as in the Scrophula, & not in the Gland itself: however whenever the Duct is wounded do not attempt to prevent the Saliva discharging upon the Cheeks by plugging up the Wound with Tents as was the old Practice, but try with Superficial Dressings only, to heal ye Wound, and if they will not succeed I would carry a Seton thro the Cheek in order to divert the Discharge; the French proposed a hot Skillet to be passed thro, to make an artificial Open^g; but the Thoughts of Fire carries too much Dread with it, & the Seton answers the Intention better; — was a Patient to apply to me with a Division of this Duct, I would try what Pressure upon that Part of it next to the Gland might do by preventing a Flow of ye Saliva to the Wound, as we do in Haemorrhages from Arteries & Veins, & make use of Superficial Dressings to the Wound —

The Submaxillary Gland is of the conglomerate kind of a yellow Colour situated under the arch of the lower Jaw, and extending under the Tongue; it receives its arteries & veins from different adjacent Parts — It separates Saliva and in Salivations appears turnefied under the Chin & therefore we advise Flannel to be wore over these Parts — It sends off a large Duct called Wharton's Duct which opens into the Mouth near the Sublingual Gland between the 2 & 3 of ye Dentes Incisores of ye. lower Jaw on each Side of the Frenum —

The other Glands are the Sublingual — Some authors have contended whether they are or are not continuations of the last but I never could discover any Fluid of a Salival nature coming from them, and I imagine them to be mucous Glands like the Tonsils composed of an. of Follicles —

Heister describes two other orders of Glands, ye. one called molares, ye. other Buccinatores, from their Situations; but I believe no such Glands do exist, and wht. he took for them were only little fatty appearances which are in every part of the Body serving merely to fill up Interstices —

The different Hypotheses concerning the Seat of this Sense would be irksome to mention — y^e. seat is generally supposed to be on y^e. Inside of y^e. Nostrils; and it is said that People who live at remote Distances from large Towns have their Smell more perfect than those who live in them; this appears to be owing to the different State of y^e. Air, it being more clear & serene in the Country; and we are told that the Savages in some parts of America can trace one another many miles by Smell alone — The Nose is divided into its Body, ala, Lobe, Extremities, & Ridges; & it is seperated longitudinally into two equal parts internally by a Septum — It is covered externally by y^e. Cuticle, and laterally under it are a thin Plan of muscular Fibres in some parts; and under the Cartilaginous part is a fine Membrane said to be a continuation of y^e. Pericondrium which is no more than a continuation of y^e. Periosteum — I have known some old Physicians recommend Bleeding in the Nose in violent Head aches — The Septum is part Boney & part Cartilaginous; the Course of y^e. Nostrils on each Side this Septum is inflected, running backwards over the Velum Palati and opening or terminating in the upper part of y^e. Pharynx: the whole Passage of them is lined by y^e. Cuticular Memb^e. under which laterally are placed some small Bones called ossa Turbinata vel

vel Spongiosa; these are on each side, one is a portion of the Ethmoides & the other a distinct one — The ethmoidal Bone is only a Series of Cells, as is the maxillary Sinus, which communicates with the Nostrils; these cellular Bones are seldom found alike in two Subjects, being very irregular & intersected by long bony partitions: besides these Sinuses there are also others which communicate with the Nose, viz. the frontal, all which discharge a quantity of mucus wch. the Cridus membrane is always kept moistened, whenever we are in different Positions; thus, when we are Erect it comes from the frontal Sinus; when the Head is inclined to either Side as in Bed then it pours out of ye. maxillary Sinuses, and when we lean forwards & downwards, from the Ethmoidal Sinus — The membrane by wch. this ~~mucus~~ is secreted is called the Cridus memb.; there are many little Eminences upon its Surface which have been taken for glands but are only Follicles which I consider as Reservoirs for the mucus — This membrane is Subject to a Disease called Polypus, which we meet with sometimes in all other mucus membranes in the Body; it is more difficult to Cure according to its Seat, vid. Operations; but we should take care not to mistake an Elongation of ye. membrane for a Polypus as it is sometimes done & an Incurable Ozena has been the Conseqce.

of

of ~~attempting~~ the Extraction & Abscesses may form in the Ethmoidal Cells rendering the Bones Carious & are very troublesome to heal. Some assert that the frontal Sinuses are formed by the action of ye. frontal Muscle, but this is erroneous; we find this Sinus is often affected with a Caries, for the Cuticus membrane lining them is liable from its Vascularity to Inflammation & Suppurating, the matter has not a free Exit, hence it causes a Caries of ye. Bone with Exfoliation &c. I have seen several of these Cases, and they are always attended with great Pain in the Part & about the Face, particularly under the Orbits, attended with Sudden Discharges of fœtid Matter into the Mouth & nose; these will try the Patience of any Surgeon: I would advise Sternutatories to promote a Discharge by Sneezing; but never to make an Opening externally into them. These Sinuses have a certain Share in the Smell, as we see those Patients who have had them destroyed, have this Sense as well as the Sense of Taste very much impaired —

On the inside of ye. Nostrils are placed a great no. of Hairs to prevent any extraneous Body getting upon & adhering to this Membrane —

The mucus in the nose was by old Surgeons supposed

— to

to ~~be~~ proceed from the Pia mater thro the different Perforations in the Ethmoidal Bone, but a Person the least versed in anatomy will know that the Communication between them is entirely stopped up & that these Perforations serve for the transmission of Vessels — Thus the common People think that the Snuff they take, passes into the Brain by this way —

Just behind the Nostrils is situated the Eustachian Tube, which is sometimes advised to be syringed in Deafness for which purpose a Straight Syringe is best —

On the Organs of Hearing —

Some anatomists have divided these into three Parts the external, middle, & internal. The external pts. are very irregular & cannot be well described; the genera. Division of them is into 2d. Ala or Wing, the Penna or Lobe; the Ala is the upper part & the Penna the lower. The external parts of d. Ear are covered by common Integuments with Cartilage under them — Some say there are many Sebaceous Glands, but they appear to be only Follicles ~~situated~~ as in the Cutis of the Face & other Parts — The Cartilage is continued to form the Concha which grows thinner as it approaches

towards

towards the meatus auditorius; the ala has no proper muscles to it, but the Pinna has a few muscular Fibres sent to it —

The meatus auditorius runs in an oblique Direction towards the Face, and is a Continuation of ye Concha only the Cartilage is very thin; it is composed of Cartilage covered by Cuticle & Cutis — When we examine the Ear to see whether any thing is in the meatus auditorius we should draw the Ear obliquely forwards with one Hand & with the other keep the ala backwards by which means we bring the meatus auditorius to a Straight Direction; and when we Syringe the Ears we should direct the Tube a little obliquely towards the Face. The Larger semicircular Eminence of ye External Ear is called the Helix, the smaller or lower Eminence is called the anihelix — The meatus auditor. is lined internaccy with little glandular Bodies which are some times visible to the naked Eye which Deposit a thicky matter of a yellow Colour called Cerum or Wax, which is defence to it; this sometimes inspissates & stops up the Passage causing Deafness which is the most common Cause of that Complaint, which is remedied by a drop of oil poured now & then into the Ear which softens the Wax & renders it easy to be extracted.

MV.

Mr. Cowele made use of a piece of fresh Cabbage Stalk cut into the Shape &c. of yd. Passage which was introduced & kept there for some time & produced a good Effect in softening the Wax —

The meatus auditor. having run a little Distance obliquely towards the Face is then reflected backwards a little & then becomes bony; the bony part is a long canal lined by the membrana Tympani ~~which~~ ~~is a fine membr~~ which is a fine membr. spread over the Cavity called Tympanum: on this membrane it is supposed the Sound Strikes; its Situation is different in the Fœtus & Adult, in the Fœtus it is not perpendicular as in the adult, but oblique —

The Tympanum is formed entirely of Bone; it has two Cavities in it in the Fœtus but only one in adults; in the Cavity of yd. Tympanum are placed the Incus & Malleus which are articulated to each other and are also connected to the 3d. Bone of the Ear called Stapes; the Tympanum has 4 Foramina in it, one of which is the Eustachian Tube which is partly membranous, Cartilaginous & Bony and opens into the mouth near the upper & back part of the Velum Palati, hence People who are Deaf com=

monly

The Organs are by some divided into external & internal — all those ~~Parts~~ that situated within the abdomen & Pelvis, as by the first are meant the Testicles, which may be called the primary organs of Generation, ~~the~~ Penis, and the Scrotum; by the latter, the Spermatic arteries & veins, Vas a deferent. Vesicales Seminales & Prostate Gland. The urinary Organs are likewise divided in a similar manner.

Others again would have them ~~again~~ divided into the preparing, ~~containing~~ & propelling Organs; the Kidneys & Testicles they would call the preparing Organs of Urine & Semen; the Bladder & Vesicul. Seminal. the containing Parts; and the Penis & Urethra the common propelling parts — These are each liable to objections and it is of very little consequence to attend much to either:

~~Befor~~ Previous to the particular description of

monly open their mouth when People are talking: an obstruction in this Tube may be the Cause of Deafness in some measure for which we are told to Syringe it, which may be done by carrying the Syringe thro the nostril wch will lead it straight to the Orifice of yd Tube in the Velum Palati — If Deafness proceeds from a defect of the auditory nerves then nothing will remedy it —

For a particular Description of ye Ear vid Monroe Osteology, Cheselden's anatomy or Du Verney's Treatc on the Ear —

On the Male Organs of Generation.

There is such an intimate connection between the Urinary & Genital organs, & they are so blended together, that I shall consider them together & speak of them as is most convenient for shewing their Situation &c — The Genitals are, the Penis, Testicles, Vesicula Seminales, prostate Gland, Scrotum, Spermatic arteries & veins &c — The Urinary Parts are the Kidneys, ureters, Bladder & urethra which last is common to both.

The Spermatic arteries are two in number, generally arising from the aorta between the Emulgents & mesenteric inferior and running one on each to

each

of the organs, a general description of the Parts as they appear dissected for Lecture is to be given.

* These arteries vary exceedingly in their origin; sometimes they arise as here described and are always represented so in Drawings; but they are sometimes observed to run from the Emulgents on one or both sides, sometimes from the Phrenic artery on one side & from the aorta on the other &c. —

to each Testicle* they have a long Course to run before they reach the Testicles, which some have said was purposely designed by Nature that the Circulation thro them should not be too rapid for the more easy Secretion of Semen; but this Notion as well as their arising small & growing larger as they approach the Testicles for the same reason as above, I pay no regard to; the last is absolutely not true & with regard to the other, at the first Formation of the Testicles Nature has followed the same rule that she does in every other part of the Body; which is, to send off the arteries & veins to diff.t Parts from the nearest large Branch to that Part, which is the Case with regard to the Testicles, to which it is most convenient for the ~~Vessels~~ ~~to be sent~~ arteries & veins to be sent from the Aorta whilst in the abdomen in the Foetus — The artery then passes downwards & soon meets with the Veins ~~when they are closely Joined~~ ~~by~~ ~~illar nerve~~ ~~have~~ and pass onwards to the ~~and the Scrotum~~ They meet with the Vas Deferens abdominal Rings where which, together with the nerve, form the Spermatic Cord, & pass out of the abdomen thro the Rings together. The artery and Vein are seperate at their Origin but approach nearer to each other as they pass downwards, and at the abdom.l Ring they adhere so closely together that it is with great difficulty that they can be seperated; hence some anatomists affirm that they anastomose with each other & make an Experiment to prove it; but it is quite contrary to the Course of Nature that Ring Vessels should

* A preternatural Distention of these Vessels is frequent and something is taken for a Hernia by those who are not well acquainted with Anatomy

should communicate; and their Experiment seems to shew that their collateral Branches (for each of them send off Branches in their Passage) have some communication & by this means Quicksilver poured into the artery from above a Ligature made on it may pass out of the artery into the Vein —

The Spermatic Veins are generally two in Number: they do not both Spring from the Cava; the right commonly does, but the left allways comes from the Emulgent of that Side, which has given rise to many Hypotheses about the Reason of it, and one principal one is, that if it had come from the Cava it must have passed over or under the Aorta whose Action would have impeded the Circulation thro it which is by this means prevented; but this is of no Consequence, and the true Reason is, that the Emulgent was the nearest large Vessel to the Testicle whilst in the Cavity of the Abdomen — The Veins have no Valves whilst in the Abdomen but as soon as they have passed the Rings the Valves are then very Numerous —

The Spermatic Artery, Vein & Excretory Duct of ye. Testicles as they pass thro' the abdominal Ring are connected together by a quantity of cellular membrane and are inclosed in a thin ligamenous Expansion sent from the Abdominal Muscles, & which is called the Tunica Vaginalis of the Spermatic Rope by Mr. Sharpe; these Vessels thus connected together with the nerve form what is called the Spermatic Rope or Cord, ye. Figure of which is Pyramidal; which is occasioned by these Vessels after they pass thro the Ring towards the Testis beginning to be inflected & rolling backwards & forwards in many Serpentine Convolutions gradually become wider & wider as they approach nearer to the Testis —

A preternatural distension of these Vessels * are frequent; and sometimes * are taken for a Hernia by those who are not well

acquainted

* The distention is of the veins and should be remedied by bracing the parts by means of cold applications, cold bath, and removing every kind pressure that might serve to impede the circulation. Here we are speaking of a mere simple varix, unattended with any painful symptoms; but this distention may sometimes be owing to a cancerous disease; in which case the Testicle itself is generally affected and it is accompanied with a great deal of pain &c — it is evident therefore that the cure is to be attempted in a different manner from that above mentioned — In strong athletic people who have abstained from venery for a great length of time the vas deferens is said to become distended, painful & hard like a tense chord, frightening the persons, in whom it happens, so much as to induce them to apply to Surgeons for relief, not knowing from whence the ~~[illegible]~~ complaint proceeds — A case of this kind I once saw in a young Tailor who applied to me on this acct. and as I had no doubt of the cause I recommended a remedy that is too obvious to need mentioning which had ~~the desired~~ an effect that was no doubt pleasing in a double sense to the Patient, from whom heard no more of the complaint afterwards

† A young Lad was sent up from Rochester to St. Thomas's Hospital who was said to have a strangulated Hernia; which proved to be nothing more than the Testicle on one side lodged ~~in~~, and forming a Tumour in the Groin —

B.

acquainted with anatomy ~~[illegible] no Concern [illegible] Sale that [illegible] any thing [illegible] may be a gentle Purgative on the Bowels by a [illegible] to the Waistband & [illegible] which may [illegible] too great Distension~~ —

The Testicles are two in No.; tho' some authors say they have sometimes found 3 or more, yet it is probable they mistook a swelling in the Scrotum or an Enlargement of the Epididimis for a Testicle: — it may happen that a Person shall have but one Testicle or none at all in the Scrotum & yet shall be able to beget Children; in which case there is no doubt but that the Testicles are still within the Cavity of ye Abdomen, having met with some Obstacle to their passing thro the Rings at the usual time, either from their Size or ye Smallness of the Rings by which they were detained in the Cavity — Sometimes we meet with one lying half way thro the Rings & forming a Swelling in the Groin; and there have been Instances of such being mistaken for Bubaes & treated accordingly with warm Plasters &c — *

The Situation of the Testes in a Fœtus is generally on the fore part of the great Psoas muscle just below the Kidneys; but they are supposed to be lower down in a Fœtus of 9 months than in one of 5 months, as they gradually descend; they are at this Time covered by the Peritoneum & may be considered as long as they remain in the Cavity of ye Abdomen as a Viscus or Viscera, being as complete in every respect as in the Adult only more minute, the Epididymis lying loosely upon it & the Vas deferens taking its course now downwards into

the

the Pelvis but in the adult it mounts upwards from the Scrotum; the only difference is, that there is a kind of soft Ligament called Gubernaculum which is peculiar to the Foetus & is broader above, where it adheres to the Testicle & narrow below at the bottom of the Scrotum; this is likewise covered by Peritonaeum as far as the Rings, and in adults it is lost in the Scrotum. Mr. John Hunter thinks it is muscular & membranous, and that it is a Portion of the Cremaster muscle which in all Quadrupeds is very strong and from dissections of Rams & Hedge-hogs he takes his opinion; in the Human body the Cremaster is very weak — In Quadrupeds the Cremaster, a portion of it at least, descends & helps to form the external Covering of the Testicles according to Mr. J. Hunter; but in the human Body we know this muscle is so very small that it can act with but little force in drawing up the Testicles which is the use assigned to it; its Fibres are so small as hardly to deserve the name of a Muscle — The use of the Gubernaculum is to facilitate the Passage of the Testicles thro the Rings by going before them & gradually dilating the Rings — It has been supposed that the Action of the Diaphragm in Respiration forced the Testicles out of the Abdomen, but we have Instances of their being in the Scrotum at the Birth before the Diaphragm have acted at all —

Thus we have seen the Testes & its Vessels whilst in the Abdomen entirely covered by a reflection of the Peritonaeum consequently when they descend they must carry a Portion of the Peritonaeum thro the Rings with them into the Scrotum;

where

where it takes the Name of Tunica Vaginalis, and all communication is now Shut up between the Cavity of ye. Abdomen & the Testes, by this Tunic closely embracing & surrounding the Cord and adhering to it — In Quadrupeds however this communication is always open — It will be requisite to carry this in our minds, in order to form a true Idea of the Hernia Congenita & the Difference there is between it & the other Ruptures: by the Hernia Congenita is meant that Species of Rupture where the Contents of the Hernia lie in immediate Contact with the Testicle, which Mr. Hunter first demonstrated in a clear Light in the following Manner: The Tunica Vaginalis we have observed is a continuation or Process of ye. Peritoneum including the Testis & its Vessels &c. all of which pass together thro the abdominal Rings which are tendinous & inelastic, and as soon as they have passed thro, all communication is Shut up between the Abdomen & Testis; but at the Time they pass thro', if a piece of Omentum or Intestines should pass down with the Testes, it will not perhaps descend quite to the Bottom of ye. Scrotum, but notwithstanding will prevent the Tunica Vaginalis embracing and adhering to the Cord & thus would prevent the Communication being closed up and in time as it descends more & more comes in immediate Contact with the Testis: Thus if any Body insinuates itself between the Cord & the Vaginal Tunic. at the Time of the Descent into the Scrotum, the Passage is ever after free and there is an open communication between the Testis & Cavity of ye. Abdomen: this is always the Case in Dogs & other Quadrupeds, hence we more frequently meet with Ruptures of this Kind in them, which they bear without

without any great Inconvenience except the Weight when very large — But the Hernia Inguinalis or Scrotalis which are most frequent in us, are occasioned by a Descent of Omentum or Intestines or Both, thro the abdominal Ring, and as they are contained within the Peritoneum, they must take that along with them and still be inclosed within it and hence it is called the Sac or Bag of the Hernia which lies seperate from the Testis & upon the external Surface of ye. Tunica Vaginal. whereas in the Hernia Congenita there is no distinct Bag to contain the Hernial Contents but they lie in immediate contact with the Tunica albuginea of the Testis; and as the last are first formed in our Infancy only, they are not so frequent as the common Scrotal Hernia which may happen at any time of Life; and tho' the Hernia Congenit. may remain unnoticed for many years by a small Portion of the omentum forcing itself between the Cord & Tunic, yet afterwards by some accident or other it is forced down & becomes a true Hernia Congenita in the adult —

The Coats of the Testis are two, the Tunica Vaginalis & the Tunica Nervia or albuginea —

The Tunica Vaginalis we have shewn to be a process of the Peritoneum and in Structure in every way similar to it, having its external Surface rough with a quantity of cellular membrane & its internal smooth & even — Its Extent is as high up as the Superior part of the Epididymis where it adheres to the Cord; from thence it lies loose & seperate from the Testicle in every part except at the Posterior part where the Epididymis is situated and at this Place it adheres to the Testicle and is reflected over the Testicle in the same manner as the Peritoneum

is

is over all the Peritoneal Viscera, and adheres to the Tunica Nervia; the Tunica Vaginalis is kept seperate from the anterior Part of the Testicle by a thin Watery Fluid similar to the Liq: Pleuræ, Peritonæi &c. which when it accumulates in too large a Quantity ~~constitutes~~ the Disease called a Hydrocele. Many Causes have been given by different Writers upon the Subject, of the Occasion of this Accumulation, and Morgagni was of Opinion that the Disease was owing to the Rupture of some of w. Hydatid w.h are small red Globular Bodies found in almost every Testicle at every Age adhering by a Slight Thread to the Body of the Testicle & sometimes to the Epididymis and was supposed to serve as Glands for the Secretion of this Fluid; they seem to be natural Appearances, but their use is not known as I cannot think they are in any Shape assisting in the Secretion of this Fluid, which I look upon to be entirely Vascular, that it is continually deposited by Exhalent Vessels & as fast taken up by Inhalent Lymphatics or Absorbents; and it is my Opinion that the Disease is owing either to a Rupture of some of these Vessels, or to a Relaxation in the Absorbents by which they are rendered incapable of absorbing the Water as fast as it accumulates. and I am of Opinion it is often owing to a Rupture of the Lymphatics from the Case of a Gent.n who was my Patient, who whilst he was in the Play-house & was very warm, felt something crack very distinctly in the Scrotum, from which time water was gradually collected & formed a Hydrocele of which I cured him by Caustic ——

The Cure for this Disease is either radical or Palliative; the first is done by discharging the Water from time to time as it

accumulates

Qu 7. Mr. Else is mistaken in supposing the Tunica vaginalis sloughs, as he asserts it does, in the cure of the Hydrocele by Caustic. I had an opportunity of proving the contrary by dissection in a man who died in the hospital a fortnight after the caustic had been applied. The cure was going on favorably, but the Tunica vaginalis was every where perfect & sound, except where it had been destroyd by the action of the caustic, which had penetrated quite thro' the substance of the tunica vaginalis, to about the circumference of an english shilling, and the part thus killed was nearly separated from the healthy tunica; in every part of which on its internal surface, as well as on the external surface of the tunica albuginea testis, were the most evident appearances of the adhesive inflammation. The Preparation I made is carefully preserv'd in the Museum of the Teacher of Anatomy* at the London Hospital; and I have now no doubt of the fact that the radical cure of the Hydrocele by Caustic, or by any other means (except excision) is by adhesion.

* Mr. Wm. Blizard, to whom I disposed of it amongst a variety of other valuable & beautiful preparations of diff.t parts of the

accumulates by Puncture with a Lancett; the other is by creating an Inflammation of Tunica Vaginalis by different methods which ~~throughs~~ away & the disease by that means cured & prevented from a Return — Vid. Else on Hydrocele —

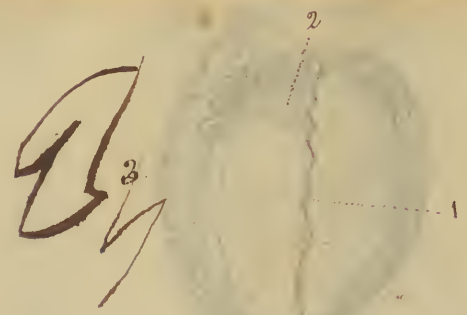
There are a few muscular Fibres spread upon the upper part of this Tunic, called the Cremaster muscle; and tis said the more strong these are, the more Salubrious the Person is. — The use is said to be to draw up the Testes in Coition & at other Times —

The Tunica Nervia lies immediately under & is connected to the reflected Coat of ye. Tunica Vaginalis; it is a Strong, thick tough, white membrane immediately inclosing the Substance of the Testicles and adhering to it —

The Substance of the Testes appears of a brown cinerition Colour which is composed of a Series of Arteries, Veins, Nerves, Lymphatics & Secretory Ducts with their connecting membranes; and what is remarkable of these Vessels is, that they are observed to be smaller in the larger Animals than in the small in proportion to the Size of the Animal; thus in a Horse they are so minute & interwoven that it is impossible to unravel them; in a human Subject they may be partly unravelled, and in a Rat after proper maceration they may be unravelled entirely into one String. A French Author has computed that if they could be entirely unravelled & drawn out in a human Testicle, the String would measure 300 miles in Length —

The Secretion of the Testicle seems to be vascular & performed in this manner; the Spermatic Arteries ramify very minutely thro the Testis and some of its Branches terminate in the Veins which return the Superfluous Blood, whilst other Branches termi-

nate



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This Figure is designed to represent the Testicle with the Epidi-
dymis adhering to it at each Extremity. In the Body of ye Testis are to
be seen many small Tubes running, as is supposed, from the extremities of
the arteries and conveying Semen into the longitudinal Line the Rete,
from the superior Extremity of which, the Vasa Efferentia go off to
form the Epididymis.

1. The Rete.
2. The Vasa Efferentia.
3. The Epididymis, which terminates in
4. The Vas Deferens. —

in a No. of small Seminiferous Tubes which convey the Semen that has been Secreted during the Course of the Arteries thro the Testes, into the Vas deferens: these Tubuli are very fine & run in many directions and meeting in the middle of the Testes they form several larger bodies lying close to each other & running from one Extremity of the Testis to the other and is called the Rete, from the upper Extremity of which a number of Tubuli are continued and passing out of the Testicle go to terminate in & form the Epididymis at the Posterior part of ye. Testicle, which is only a continuation & convolution of these Tubes, and from which the Vas deferens is continued in a convoluted Form for some distance, mounting upwards & passing thro the abdominal Ring with the Artery & Vein; after it has got thro the Ring it seperates from the Artery & Vein & passes downwards in an obligue Direction thro the Pelvis & empties the Semen into the Vesiculæ Seminales, which are situated near the neck of ye. Bladder on its inferior Surface —

Within the Substance of the Testes are observable a No. of white Cords running in a transverse Direction between the minute filamentous Strings of the Testis, which appear to be continuations of the Tunica Nervea. Their use is not known —

The Epididymis sometimes becomes indurated & is mistaken for a Schirrous Testicle for which the Operation of Castration has been performed; I have known it cured by cold Bathing, & if from Venereal Cause rubbing mercurial Ointmt. upon it; in general however, it will give way to no application whatever — These Indurations seldom or never prove Cancerous which those of the Testis often do —

The Epididymis adheres to the Testis at the Posterior Part, lies loose & seperated from it in the middle & again adheres to it at its anterior

Part

part, where the Vas deferens goes off from it — It is covered by the Tunica Nervea which is thinner here than upon the Testes; it has a Branch of yd. Spermatic artery sent to it, and a little Twig of a nerve at its lower or anterior Extremity —

Urinary Organs —

There is a vascular Substance situated at the superior Extremity of each Kidney, called Capsula or Glandula Renalis, generally of a Triangular Figure, tho this is various as well as its Size: it is placed between the Diaphragm & the Kidney, its inferior Part resting upon the superior Extremity of yd. Kidney & its superior Part lying under the Diaphragm — Anatomists differ about the Structure & Use of it — It has been said that it is larger in the Fœtus than in the adult: it is certainly larger in Proportion; but it is larger in the adult than in the Fœtus, tho it does not increase in Size in proportion to the Kidneys & other Parts, and in old People it wastes & becomes wrinkled. It receives its Arteries from the Aorta commonly, but sometimes from the Emulgent & Phrenic — it has a large Vein coming from it which runs into the Emulgent: it is lodged behind the Peritonæum as well as the Kidneys and like them receives no Peritonæal Covering, only the Peritonæum lies before it — It is covered by a fine membrane proper to it & the Kidneys — Its Colour in the Fœtal State is of a florid red which it gradually

changes

changes to a brownish Yellow and in Old People to dark complexion — Some have thought it to be a Gland, but as no Excretory Duct has ever been found belonging to it, I can't see the propriety of calling it a Gland; Vesalius thought he had discovered its Duct, but he was mistaken, for it was only a small Vein which run from the Emulgents to the Testes in Men & the Ovaries in Women, which he took for the excretory Duct, hence he thought it served some Purpose in Generation — Its use is not known, but as we always find it much larger in proportion in the Fœtus than in Adults it is probable it serves some particular purpose to the Fœtus which is not so necessary in the Adult —

The Kidneys are the primary Organs of Secretion of Urine as the Testes are of Semen. In Shape & Figure they somewhat resemble a Windsor Bean. The Superior Extremity lies a little below the inferior Surface of the Diaphragm; its inferior Extremity is generally even with the Spine of ye. Ilium tho' sometimes it is lower down: its anterior Surface lies immediately behind the Peritoneum & ye. posterior Surface is turned towards the Quadratus Lumborum & the Sacro-Lumbal Muscle. The Situation in general is between the last of the false Ribs & the Spine of ye. Ilium — In anatomical Plates the right Kidney is generally delineated as the highest, but in the Human Body they are nearly opposite & if either is higher

ot than the other it is the left; but there is seldom any diffce. & when it does happen the right is generally pressd down by the Liver: and in Diseases there is no Viscus so liable to be displaced in the Abdomen as these are & they are sometimes found almost wasted away & very small, at other times greatly enlarged —

The external Surface of ye. Kidneys is smooth & even in adults & appears to be a conglobate Gland, but in the Fœtus it is of a very fine conglomerate appearce. being divided into many little Globes which disappear gradually as we advance towards Puberty — They are not covered by a Process of the Peritoneum as some have asserted but they lie behind it & are covered by a large Body of Cellular membrane greatly loaded with Fat which is of a firmer Consistence than the Fat in other Parts of the Body & is called Sevum or Suet: some say that ye. greater the quantity of Fat there is here, so much the more liable ~~to the~~ Person be to Tabulous Concretions in ye. Kidneys & thus they woud accot. for fat People being more liable to the Gravel than others; but I don't know that this is true neither does it seem at all probable that this Fat shoud produce this Effect — The Kidneys are covered by a fine thin membrane which is composed of two Lamellæ as appears by maceration; it is called the Tunica propria and it is smooth on both its Surfaces, which is different from the Peritoneum — The Vessels sent to the Kidneys

are

are the same as in all other Glands; the arteries come from the Aorta & generally arise in one Trunk each on each side the Aorta, but enter the Kidneys very often in two or 3 diff.t Branch. as each, and it is not uncommon to see the Emulgent on one side entering the Kidney in one Trunk and on the other side, in the same Subject in two or 3 — The right Emulgent artery from the course & situation of y.e Aorta must be the longest, but it is the Reverse with the Veins, the right being the shortest & the left the longest as it has to cross the Spine to get to the Cava; hence it is conjectured that the right Kidney is more liable to Sabulous Concretions than the left. In Cats & Dogs and all Animals that have much motion in their Backs y.e Kidneys are of y.e conglomerate Kind — The arteries ramify thro the Substance of the Kidneys with the Veins as in all other Glands; but whenever we find any large Vessels going to any Part which carry more Blood than can be requisite for its Nourishment, we may conclude that the Blood is sent there to undergo some material change, as in the Lungs, Liver &c.; and this is the Case in the Kidneys for y.e Emulgent artery is very large & carries much more Blood to the Kidney than is necessary for its nourishment alone; however the Lungs & Liver have particular Vessels sent to them for their Nourishment, but the Kidneys have no arteries sent to them for that Purpose, but are nourished by some of the Ramifications of the Emulgents.

The Number of Kidneys is generally two, but I have heard

of Instances of three being found seperate & distinct with each a seperate Excretory Duct; & sometimes we hear of Prot.ns of only one, but having two excretory Ducts & two arteries, which was probably owing to a preternatural Enlargement of the Two & increasing till they Joined, an Instance of which I have in a preparation; this is called a Horse-shoe Kidney. The Substance of the Kidney is divided by Winslow into its Cortical, Tubular & mammillary Parts; but in reality it ought to be said to be composed of only two Parts, the Cortical & Tubular, as what he means by the mammillary part is no more than the Tubuli terminating in Blunt Points: — The cortical is the external part which is exceedingly vascular & hence supposed to be the principal & immediate Seat of Secretion, which is performed here & the Secreted Fluid is carried by Vessels into the Tubular Part, which is much less vascular than the Cortical & not so florid of consequence: the Vessels from the Cortical Part take rather a reflected Course tho' not so much as authors describe; There appear a no. of Corpuscles or little Eminences by some looked upon as inspissated adeps lodged here, but this I cannot determine; if you inject a Kidney by the Vein they entirely disappear, but inject by the Artery & you will find them still to exist —

There are very high Disputes about the manner of Secretion in the Kidneys as in other glands; some being for the Follicular Doctrine & others say it is vascular; but it

but it is not of much consequence for us to know which it is, more than as a matter of Satisfaction —

We are not to look upon the Tubular Part as made up entirely of ye. excretory Ducts coming from the Cortical part, tho' it is thro them that the Fluid is conveyed from the cortical part; at the extremities of these Tubuli are formd little Papillæ from whose orifices there are continually distilling small drops of the Secreted Fluid into the Infundibula of the Pelvis of ye. Kidney & in the dead Subject we can frequently press the Urine out of these Papillæ —

The Pelvis of the Kidney is nothing more than a Dilatation of ye. Ureter or Excretory Duct at its origin from the Kidney, & from the Pelvis there go off many continuations of its Substance, like the Fingers of a Glove going off from the Glove, which are distributed thro the Tubular part of the Kidney and embrace with open mouths the Papillæ from which the Urine drops into them & is conveyed into the Pelvis & thro the Ureter into the Bladder; they are called Infundibula.

The Kidneys are liable to the same Disorders that all other Parts are that are Vascular; they are frequently attacked with Inflammation, abscesses & sometimes Schirrosities have been found in their Subst.e indeed they are more liable to Inflammation from Sabulous Concretions formed in the Infundibula, which if not

not carry'd off into the Ureters & so into the Bladder may form Calculi in the Kidneys & often excite Inflammation & at last create an abcess or ulcer in the Kidney. we know that in all parts lined with a mucous memb.^r there is a quantity of mucus discharged with the secreted Fluid which pass thro them as in the Urethra &c — and this Mucus is lodged here to defend the parts the Fluid passes thro from the acrimony of the Fluid & there will always be an increased Discharge of y.^d mucus in proportion to the Irritation of y.^d membrane; therefore when any calculous Concretions are lodged within any of these Parts upon this mucus membrane, by its attrition against it, it wears it away & the Salts of y.^d Urine irritating the membrane now robbed of its Defence in this Part causes great pain & Erosion of the membrane which brings on Inflammation of all the mucus membrane with an increased Discharge of mucus continually flowing away with the urine, and this is frequently mistaken for Pus & the Patients are said to have Ulcers in the Kidneys, & as we allways find a greater Quantity of mucus in the Pelvis of y.^d Kidney in a sound State it is most probable if it is discharged in large Quantities that it proceeds from that Part — It is a matter of some Consequ.^ce for us to be able to distinguish this increased Discharge of

mucus —

from Pus, & this can only be known by the Symptoms of Excoriation, the Smell of the Pus &c. —

From what has been said it will appear evid.t that the operation of Lithotomy of y.e Kidneys can never be successful; for whenever there is a Stone in them it must be lodged in the Infundibula or Pelvis so near the Entrance of the great Vessels that they must be inevitably wounded in the Operation which would produce a Hæmorrhage w.ch no art could stop; besides if we consider the great q.ty of Flesh we have to cut thro before we get to the Kidney as all the Sacro Lumbal mass, I think no man in his senses would undertake it; and I am of opinion that in all the Cases related to where it is said to have been performed, that the Stone had worked its way out of the Kidney & formed a deep seated abscess in the Sacro-lumbal Mass which being opened a Stone has been found & hence the operation was said to be performed of cutting for the Stone in y.e Kidneys with success if the Patient did well: as we have Instances of Stones in the Gall-Bladder doing the same & working their way thro the Peritoneum point externally upon the abdomen w.ch being opened they are taken out & the abscess heals: and the same thing has been related of Stones in the neck of the Bladder of urine forming abscesses in Perinæo. viz. a Case of Gooch. —

Tho it would seem more regular to proceed now to describe the Urinary Bladder & Urethra, yet I leave that & go to the remaining parts of Generation & describe them first, after which I shall speak of the contents of ye. male Pelvis.

The Scrotum is a loose membranous Bag serving as a Purse for the Testicles, divided internally into two equal Parts, each containing a Testicle, by a membrane called Raphe or Septum Scroti, which is a continuation of ye. Raphe in Perinæo & may be traced externally in a darkish line running from the Perineum to the upper part of ye. Scrotum — The Scrotum is composed of ye. Cutis & Cuticle and its Cellular membrane which is of ye. Reticular kind — The Testes lie loose in this large Bag, and the Reason assigned for the largeness of it is, that if the Testes had been confined more closely in a smaller Bag or if it had been adipose, they would not have played or receded in it so freely & consequently would have been more liable to Injuries from Blows or Pressure — Some authors say there is a muscle belonging to the Scrotum, which is called Dartos & that by this it has its contractile power, but I never could discover any muscular Fibres in it by Dissection or maceration — The Septum I have observed was a membranous Partition

dividing

Dividing the Scrotum internally into two equal Parts each of them inclosing a Testicle & by this means shutting off all communication between the Testis & the other: this prevents their being in Contact with each other, so that one Testicle may be diseased without affecting the other which wou'd have been the Consequence had it been otherwise, and likewise prevents the Injuries which Friction against each other might cause: this membrane is continued from the external Line or Raphé, and is cellular as appears from preparations; there are some who deny that the Septum excludes all communication from one Side of yd. Scrotum internally to the other, from observing that by blowing Air into one Side of the Scrotum you will equally distend both; but this is owing to some of the tender Cells of the Septum being broke thro' by the Force with which the Air is thrown into them; but the most convincing proof of it's Existence is the Hydrocele of one Side of yd. Scrotum only —

The Scrotum is vascular like other common Integuments and upon the Septum a pretty considerable artery is running, which shou'd be one Reason why in Castration we shou'd carefully avoid wounding

the

the Septum, but the most material Objection to our wounding this membrane in this Operation if it is of one Testicle only is, the Exposure of the other sound Testicle to the external air, to the Dressings &c. which would bring on a dangerous Inflammation; and therefore we should be very careful in dissecting away the Testicle from it, but if ye Testicle should adhere in such a manner to it or has rendered it diseased, that we should be under a necessity of removing it along with the Testicle, in order to obviate the ill Symptoms which might arise in consequence of ye Exposure of ye other Testicle, we should make an artificial Scrotum for it with the Integuments; this you had an opportunity of seeing me do with a Patient who had a Cancerous Testicle taken out with which I was obliged to remove a part and indeed almost the whole of ye Septum which occasioned the other to be exposed naked to the air, but by drawing over the Integuments & making a stitch or two to confine them over the Testis the Inflammatory Symptoms which would probably have ensued were obviated & the Patient did well — The Scrotum being of ye Reticular kind of cellular

Membr.

Membrane, we must not be surprised if we meet with large Extravasations of Blood in it from a slight Blow or Injury rec.d upon or near above it; and likewise that is the Reason why we see it so much distended with Water in Dropsies — vid. Lect.d on the Memb. Cellularis —

The Penis needs no Description as to its Situation, Size, Shape &c — It is compos'd of an infinite No. of Ligamentous Columns or Sheaths, divided into 3 Parts or Columns; the 2 Superior are called Corpora Cavernosa, the inferior one called Corpus Spongiosum — The Corpora Cavernosa arise one on each Side from the inferior part of y.e Knobs of y.e Ischium, and running upwards towards the Pubis some distance Seperate, afterwards meet & run in close contact with each other and form the upper part of the Body of the Penis; before they unite they are called Caura Penis; they go to terminate at the Extremity of y.e Penis in two blunt Points on which the Glans Penis rests — These Bodies are extremely cellular internally and all their Cells communicate readily with each other, for by Injecting at either Eno all of them will be distended; and on the inside these Cells

are

are frequently intersected by strong white ligamentous Fibres or Sheaths which appear larger as they approach the Extremity and are of the same nature as those on the external surface. The Septum Penis is only the union of the 2 Corpora Cavernosa by means of the continuations of several of these Cords, and by it we are not to understand such a Partition between these two Bodies as the Septum of ye. Scrotum is between the two Testes; for it is evident from Injections, that there is an open & free communication between the Cells of the one and those of the other — The use of these cords is to prevent the too great Distension of the Cells in Erection — It is plain that when two Cylindrical Bodies are laid in contact ~~with~~ horizontally parallel with each other that there must be a vacuity or a longitudinal Cavity formed above & below, & this is the Case with the Corpora Cavernosa, the Superior Cavity of which is on the Back of the Penis & is filled up by the Artery sent to the Penis & the Vena Magna Penis; the inferior Cavity is filled up by the Corpus Spongiosum — There seems no material Difference in the Structure of these three Bodies, only the Cells of ye. Corp. Spongios. are finer than those of the

Corpora

Corpora Cavernosa — The Corpus Spongiosum is large at its Origin forming a large Knob or Protuberance in Perinæo which is commonly called the Bulb of the urethra, it is then continued along the inferior part of ye Penis growing gradually smaller till it gets towards the Ends of ye Corpor. Cavernos. when it expands itself & forms the Glans Penis which is proved to be nothing more than a Continuation of this Body. The Urethra runs thro' the middle and is surrounded & closely embraced by the Corpus Spongiosum thro' its whole Length till it passes out at the Extremity of the Glans —

The muscles of ye Penis are the Erectores, wch are two planes of slender muscular Fibres arising from each Ischium of ye Ischium a little below the Cruc of ye Penis, laterally; they are called Erectores from their supposed Office of forcing the Penis against the Pubis when in action & stopping the Circulation of ye Blood thro the Veins of ye Penis produced Erection but whoever considers their origin & situation must see that their acting will have the direct contrary Effect on the Penis by pulling it from the Pubis & that they can have no share in causing Erection —

The

The other Muscles are called accelerators Urinæ, wch arise from the Crus of the Ischium laterally near the Bulb of the Urethra which they entirely surround as do the Erectores the Crura of ye Penis: these are also but slender plans of muscular Fibres and are attached to the Corpus Spongios. and when they act are supposed to compress the Bulb of ye Urethra and assist in expelling the Urine — There is a small plan of muscular Fibres which take a transverse direction (running over the Perinæum transversely & hence called Transversalis; they are part of the last mentioned muscles, but are so small as hardly to be seen —

The Arteries of the Penis arise from the internal Iliacs & are called Pudendal; they pass along the Crura Penis & ramify thro its Substance; some are supposed to terminate in open mouths (Porti aperti) between the Cells & extravasating their Blood, distends the Cells & causes Erection when the Veins are prevented from returning it from the Cells — The Veins come from the internal Iliac Veins and ramify thro the whole Substance of the Penis but are much more numerous towards its Extremity or glans, which by injecting by the Vena

magna

magna appears an entire compages of Vessels: Some of the Ramifications of ye. Veins are also supposed to terminate in the Cells cum portis apertis in order to absorb the Blood extravasated by the Arteries — There are likewise spent upon the Penis a great No. of nervous Fibrills particularly upon the Glans where they appear in small pyramidal Papills & which makes it so exceeding sensible —

That the Branches of ye. Vena Magna do absorb Blood I am confident from the Experiments I have made; for Animals have been killed in the act of Coition & these Cells have been found always distended with Blood which must afterwards have been absorbed by the Veins; but this is different from all other Parts of the Body, for the Veins of ye. Penis & Clitoris are the only ones that we know or suppose to absorb red Blood —

It may perhaps be asked in what manner Erection is brought about; various are the Conjectures about it, but no satisfactory ones are yet produced: it is in general supposed to be by Blood brought by ye. Arteries being deposited in the Cells of ye. Penis and distending them and increasing its Size & Heat till the Semen is ejected

then

when the Blood is absorbed and the Penis again recedes to it's former Size — but it is necessary that a Stricture should be formed upon the Veins at the Time of Erection that the Blood may be obstructed & prevented from returning as fast as it is deposited in the Cells by the arteries; how this Stricture is formed we have no probable or reasonable accot., as all ~~the Causes~~ that have hitherto been given are either false or frivolous; we know that the mind is greatly influenced at that Time, but whether so much as to produce this Effect, or from what other Cause it is produced is unknown —

The Integuments of the Penis are similar to those of the Scrotum ~~the Cellr. membr.~~ being of the reticular Kind & liable to become distended with Water in Dropsy; The Cuticle is continued from the Prepuce over the Glans, at the Basis of which there are a No. of Follicles, by some called Glandula odorifera, in which is deposited a Sebaceous matter to lubricate these Parts, which is discharged in great Quantities sometimes & by the Heat of ye. Parts it inspissates & forms a white Scurmen, which if not washed off now & then, may irritate the Parts, creating a disagreeable & troublesome Itching especially in hot weather, ~~and an~~ increased Discharge which has been mistaken for

a

a Gonorrhoea sometimes; People with tight Prepuces are very liable to this Complaint, which is easily cured by Lotions of Milk & Water, Barley Water &c. or if the Prepuce is inflamed & tightend so as to prevent the Glans from being denuded, Injections of Barley Water & Milk & Water may be used, & desiring the Patient every time he makes Water to pull the Prepuce over the Extremity of the Glans & compress it whilst he makes Water & by that means the Water will force its way backwards between the Prepuce & Glans & wash off the Matter — Sometimes however it is requisite to dilate the Prepuce if it is greatly tightend ~~& the~~ Gent.n applied to me some time ago who had been taking Med.es for a Gonorrhoea for two Years & had tried every method to stop the Discharge but without effect; upon Examination I found he had a tight prepuce which I divided & found large Incrustations of this thick Matter from which all the Discharge proceeded; all this was washed clean off, and the Excoriations which it had Caused ~~as~~ well as the wound of the Prepuce healed in a Short time by the use of Emollient Cataplasms &c. without a grain of Mercury — The Prepuce is only a Doubling of the Cuticle & Cutis

Cutis with a quantity of Cellular membr. between it, and is continued over the Glans serving as a Covering to it; and it is this that is removed in Circumcision — It sometimes happens in Stone Patients especially in Children that it is greatly elongated by their pulling it when they feel the Pain at the End of y. Penis; and in Sailors who have been long Voyages at Sea with a Lues on them, when they return we often meet with the Prepuce much elongated & with hard Schirrous Knots in it which we are to attempt to disperse by mere. Fractions &c. but if we do not succeed we must have recourse to Circumcision or the Removal of all the Elongated part — This Operation has been misrepresented by many Surgeons, particularly in France; they have said that they had removed the Glans Penis when it has been only one of these Schirrous Knots with an elongated Prepuce, and afterwards finding the Glans, in France they have endeavoured to make their Patients believe that by the Prayers of the Priests or such like Impositions that are grown again; by this means acquiring applause instead of Censure for their Ignorance —

At the inferior Part of the Glans there is a small Cord called the Frenum, which is formed by the Cuticle & Cuticle: it is attached to the Glans near the Orifice of the Urethra, and in some Children it will be continued quite over the Orifice and by that means causing an obstruction of ye. Urine untill a Puncture is made into it — Sometimes it requires to be totally divided, which may be done with a Lancet or small crooked Sharp-pointed Knife: there are some Surgeons who object to this Operation on acct. of our wounding two small Vessels which run by the Side of it from which they say a trouble some Hemorrhage will ensue; but if there should be a necessity for the Operation this objection would have no weight with me, as the Hemorrhage may be easily restrained by pinching up the mouths of ye. Vessels wth. the Fingers for a little while —

The Ligamentum Suspensorium is a few ligamentous Fibres running from the Pubis to the Corpora Cavernosa serving to attach the Penis to the Pubis & to suspend it —

The Bladder & Rectum are the Contents of the Male Pelvis —

The Bladder is somewhat of an oval Figure & is divided into its Surfaces, Edges & Extremities; its Apex Fundus & Body I could wish were laid aside as they only create Confusion — The anterior Surface is turned towards the Pubis, the Posterior towards the Sacrum; its upper Extremity when it is distended with water is turned towards the abdominal Muscles & then rises above the Pubis ~~between~~ empty it lies below, hence the reason why there is in Suppressions of Urine, a Tumour to be felt on the lower part of the abdomen just above the Pubis & where we may often feel the fluctuation in the Bladder when greatly distended; its inferior Extremity rests upon the Rectum — Its anterior Surface is not covered by y^e. Peritoneum but wth. Cellular membrane only; the upper Extremity is covered posteriorly by the Peritoneum which is likewise contin^d. on ~~the~~ all the Posterior Surface & to its lower Extremity, but not quite to the neck of y^e. Bladder, and from hence it is continued & reflected backwards giving a Covering to the anterior part of the Rectum where it is called Meso-

Rectum

Meso-Rectum; this is the Course of the Peritoneum thro the Pelvis, and from this we may see how it is that the Water in the Ascites sometimes forces itself down into the Pelvis between the Reflection of the Peri=
=toneum upon the anterior Surface of the Rectum & ye. inferior Extremity of ye. Bladder and forming a Tumour in Perinæo, or between the Rectum & Neck of ye. Bladder in Women; a Rupture may likewise happen here by the Intestine passing down which may become Strangulated: In the lateral operation for the Stone we are liable to cut thro this Peritoneal covering if our Incision is carried too low down or prosecuted too far upon the Bladder, which ~~[illegible]~~ might occasion a protrusion of ye. Intestines and we therefore should be upon our guard and take care to avoid it —

The Structure of ye. Bladder is nearly Analogous to that of ye. Stomach & Alimentary Canal; it has a membranous, muscular & nervous Coat with Cellular membrane intervening between them; its nervous Coat is not villous like that of the Stomach & Intestines in which respect it differs from them.

Its

Its external or membranous Coat is only a Partial one, being only a continuation of ye. Peritoneum on the posterior Part of it; the Cellular Coat as it is called is nothing more than a Body of Cellular membrane every where investing the Bladder, and underneath this is the Muscular Coat which is described in Books as if the muscular Fibres were very apparent to ye. Eye, and authors have given different Names to diffr. Plans of Fibres according to their supposed action, but all they mean is a thin Plan of red muscular Fibres running in various Directions, and so slender as scarcely to deserve the Name of Muscles; in some they are scarcely visible, and yet some authors describe the Bladder as having 3 proper Muscles to it; one they call Detrusor Urinæ, the 2d. constrictor Urinæ & the 3d Sphincter Colli Vesicæ; they are allways more visible towards the neck of ye. Bladder & Prostate from whence they appear scattered all ~~over~~ over the whole Bladder some running obliquely upwards, some circularly, others longitudinally — We are told that the use of these muscular Fibres is to propel the Urine & the Sphincter Colli prevents the Urine from being expelled so often

as

[illegible]at would have been, had there been no such Fibres, but I believe it has but little power in doing this, and it is not a circular plan of muscular Fibres like the Sphincter Ani, Ores &c. & cannot be looked upon to have the action & use here as they Sphincter Ani has in preventing an Expulsion of ye Fæces; neither do I suppose that the other part of ye muscular Fibres can have much if any power in expelling the Urine which is performed chiefly by the Abdominal muscles acting & the Diaphragm together pushing down the Viscera upon it & compressing it —

In Suppressions of Urine when the Bladder is immoderately distended, these muscular Fibres are put upon the Stretch & giving way they are seperated from each other, and if the Suppression continues for some time they are kept so long seperated that when the water is discharged they have lost all their contractile Power & are not able to recover it for some time and at this time the inner Coat of ye Bladder falls into Plica or Folds between the seperated Fibres & forms Sacculi or little Bags; several Instances of which I have seen — Hence it is that we may account for some People who have the Stone being easier at some times than

than at others; for the internal Coat of ye Bladder is extreemly sensible irritable consequently must be greatly affected by the Stone when it is rolling about loosely in the Bladder but when it gets into one of these Sacculi it remains fixed there and gives very little Pain except in uneasinesses from its Weight if it is large; this will account for our feeling the Stone sometimes & at others not; and hence we allways make it a Rule not to cut the Patient but when we are able to feel the Stone at the Time — Luckily for Mr. Stephens such a Patient as this tried her med. for Dissolving the Stone; he had been previously examined and a Stone was found which by the Feel appeared to be a large one; after using the med^e for some time he got perfectly easy & remained so during his life; he was often searched for the Satisfaction of ye Surgeons & indeed of ye Public, and no Stone ever be felt afterwards; hence it was supposed by all the Surgeons who examined him before & after the taking the med^e that the Stone was dissolved, except Mr. Nourse of Bartholomews Hospital who much to his Credit would not believe that a med^e could act as a Dissolvent at so distant a part: Mr. Stevens

however

however got the promised Reward of 5000 £ for her discovery of this supposed Lithontriptic: but to the great disappointment of the Surgeons who thought the Stone dissolved & to the Public, when the Man was opened after Death & the Bladder examined, several of these Saeculi were found in it & in one of them the Stone.

The Bladder often becomes inflamed & greatly thickened after, and in this case it will often form Rugæ on the internal Surface which have a rough Feel when the Catheter or Staff is introduced —

The nervous coat is similar to that of ye Stomach & Intestines & cannot be said to be a proper Coat: under this lies the internal, or Villous Coat as some have called it, but it is improperly called a Villous Coat, for it does not appear Villous like that of ye Stomach & Intestines, but is perfectly smooth & even —

There are some who think the internal Coat of ye Bladder & Urethra to be a continuation of the Cuticle reflected back from the Glans Penis,

and

and also that the internal Coat of the Stomach & whole alimentary Canal is a continuation of the Cuticle lining the Fauces; but this is an absurd way of arguing, for were we to admit it to be true it might with the same propriety be said to be continued thro all the Vessels of the Body as the arteries, Veins &c. passing by the Lacteals from the Intestines &c ——
The internal Coat is loose & when empty falls into Folds ——

The Ureters are two long Canals, the excretory Ducts of the Kidneys, one coming from each Kidney and in a sound state about the Size of a Goose-Quill, entering the Bladder one on each Side, where they are rather smaller; they enter laterally & obliquely into the Bladder, first penetrating obliquely the external mem.ᵒ Coat, then running a little way they penetrate between it & the muscular Coat they penetrate it & so passe on into the

Bladder

Bladder thro its internal Coat in the same man=
=ner — It has been said that their Structure is
the same as the Bladder, but I never could trace
any muscular Fibres here & I think there can be none
sent to them; because if a Stone once passes thro them to
dilate them which is often the case, they never contract
but ever after remain dilated; and in long Suppression
of Urine when these Canals become distended either by
the Urine being detained in them or from a Regurgitation
back from the Bladder into them they alleways continue
of the same Size; and this shews they have no Power of
contraction like the Bladder has — The obliquity of
their Entrance into the Bladder prevents the Regur=
=gitation of the Urine into them in common, but when the
Bladder becomes much distended I am inclined to think
that a Regurgitation does happen, and what con=
=firms me in this Opinion is that in some Nephritic
Patients I have seen the Ureters just at their Entrance
into the Bladder enormously dilated — Some People
observing how quick thin diluting Liquors will sometimes
pass to the Bladder have supposed that there was
some Communication between the Stomach & it by
Vessels passing immediately from one to the other, thinking
that

that it is impossible they shoud pass thro the Lacteals into the Circulation & then secreted by the Kidneys with such Rapidity & Celerity; but whoever considers the large-ness of the Emulgt. arteries will not think it extraordi-nary or that Nature deviates from her usual course in performing so quick & large Secretions by these Emune-tories; and no such Vessels as have been supposed coming from the Stomach to the Bladder have ever yet been found — I have before observed the Pelvis of the Kidneys was only an enlargement of these Canals, and this with the Ureters, Bladder & Urethra are all lined wth. Mucus and like all mucous membranes are liable to fleshy ~~generations~~ called Polypi, as we have instances in the nose &c. I once attended a Gentn. who had a very large Fungus of this kind in the Bladder, pieces of which frequently came away with his Urine at which time he felt very great Pain & oftentimes had an obstruction of Urine previous to its coming away; and tho never free from Pain (which is not the Case with Stone Patients for they have Intervals of Ease) he lingered out a Life of Torture for many Years: on Examination after Death the Blad-der was found preternaturally thickened & a Large Polypus adhering to it, some parts of which were in-crusted over with a gravelly matter — This is a most cruel

complt.

Complaint as no Relief can be got from art: Women who have these Polypi in the Bladder stand a better chance for Relief than Men on acct. of the Shortness of their Urethra: Mr. Warner mentions a Case of a Woman who had one of these Polypi in the Bladder which he extirpated by a Ligature conveyed to it by the Sonde-Instrument & the woman did well — In such Patients the Bladder is much Diseased & they frequently have complaints similar to those of a Stone, and on Searching, a Roughness is felt which young Practitioners are liable to mistake for a Stone, but the Feel of a Stone is very diff.t & nothing but Experience can make them Judge of the difference — In these Cases there is allways an amazing Discharge of Mucus which is very fœtid often —

The Prostate is placed at the Inferior and anterior p.t of the Bladder; it is a tough ~~fleshy~~ Substance by some called a Gland, and resembles a Chestnut in Size in Figure; it is divided into 3 Body, Apex & Basis: the broad part or Basis is turned towards the Bladder & adheres to it; the lower or narrow part is the Apex, & the middle its Body: it may be easily felt in passing the Finger up the Rectum, and is at once distinguished by an experienced Surgeon by the Feel. The Urethra does not

pass

pass thro the Centre or middle of this Gland but lies in a Notch on the superior Part of it. It has been thought to Secrete a thin mucus in Coition, which Secretion is brought about by an affection of y. Mind; but this is mere Hypothesis. it is surrounded by a quantity of Cellular membrane; in Venereal Cases it is liable to partake of y. Inflammation of y. Urethra & adjacent Parts and sometimes it suppurates & if y. matter is not discharged very early by an Incision thro the Perineum, before it points externally, it lays the Foundation of sinuous Ulcers, incurable Fistula communicating even with the Cavity of y. abdomen: therefore as soon as we have Reason from preceding symptoms to suspect matter is formed & can perceive the least Fluctuation underneath the Perineum, we are not to wait to be confirmed in it by the matter's pointing externally but make an Incision without delay thro' the Perineum to discharge the matter, & by this early operation & proper Treatmt. after it, we may save our Patient with Credit — The Dressings should be quite superficial as in the Stone —

The Vesiculæ Seminales are situated behind the Prostate lying upon the inferior & posterior Part of the Bladder. They receive a Peritoneal Covering from the Peritoneum which is only partial, besides which they have a proper Tunic; & and some say under this they have a muscular

Coat

Coat, but this I never could discover, neither could I ever find the Glands which some assert they have — They may be unravelled with great Care like the Testes appearing to be one continued Tube, running from below upwards & taking many windings form two Bodies or Lobes seperate at the upper Part but united below at the lower part towards the Urethra. The Vasa Deferentia we observed were continued from the Epidydimis & passing along with the Spermatic Arteries & Veins thro the Rings of y. abdomen run downwards from thence thro the Pelvis and passing between the 2 Lobes of the Vesiculæ Seminales at their upper part, they meet & Join together at the lower part of y. Vesic: Seminal. w.th which they then communicate & from thence go out in one Trunk into the Urethra where there is a little Eminence called the Verum montanum; they likewise have lateral communications with the Vesiculæ Seminal. as they pass along between their Lobes: hence it appears that the Vesic. Seminal. are Reservoirs for the Semen which is brought from the Testes by the Vasa Deffrentia as fast as it is se-creted by the Testes and deposited in the Vesic. Seminal. till the time of Coition when it is thrown out with great Force thro the Urethra. This Ejection of the Semen is not performed as some say by the muscular Coat of y. Vesic: Seminal: because even if such a Coat does exist it is so weak as not to be capable of performing so powerful an

Ejection

Action, but it seems to be performed principally by the Sphincter & Levators ani which are put in action at that time —

There are some who for the sake of starting new Hypothesis have given it as their opinion that the Semen comes immediately from the Testes in Coitu & that the Vesic: Seminal. are only mucus glands, but their opinion is so trifling that it does not deserve to be confuted —

The Urethra is a membranous Canal leading from the Bladder and serving for the Passage of the Urine & Semen — it is covered in some parts by cellular Memb.e in others not which is between the Prostate & bulb of the Urethra, where it is entirely membranous. The Urethra being cut open its internal Surface appears smooth & even being lined like the Bladder with a fine sensible membrane w.h is every where besmeared with mucus, and upon its Surface are a no. of little orifices or Follicles called Lacunæ w.h contain a mucus to lubricate the parts with; soon after its origin from the Bladder there appears a little Eminence on its internal Surface called Caput Gallina=-Ginis or Verum-montanum at which place the Semen enters into it, and near it are several Foramina which are said to be the mouths of the Excretory Ducts of the Prostate — Between the accelerators Urinæ &

the

the Bulb of the Urethra, there are a certain No. of small Glands called Cowpers Glands, which however are not allways to be seen in every Subject —

The Lacunæ are situated in every Part of the Urethra & are the Seat of ye Gonorrhœa, in which the Venereal Virus irritates the and creates an Inflammation on the internal surface of the Urethra with an increased discharge of mucus from these Follicles; and the Colour of it depends upon the Degree of Virulence or the Inflammation — Gonorrhœas are frequently attended with Obstructions in this Passage, which are most commonly occasioned by Strictures & not by Carunculæ as was formerly supposed; and are cured by the use of Bougies — These Strict^s sometimes obstruct the Passage of the Staff in searching for the Stone; and sometimes the Corpus Spongiosum & Verumontanum are affected & partake of the Inflam^n and are so swelled as to obstruct the Urine — Cured by removing the general Inflammation by Bleeding, Foment^s &c — The Verumontanum is often so large as to obstruct the Passage of the Staff in sounding for the Stone —

These are divided into external & internal; the external are all those Parts which appear without Dissection, and are the Mons Veneris, the Labia, Nymphæ, Clitoris, Perinæum, and some rank the Hymen & the Vagina, but this last improperly: the internal parts are the Uterus & its Appendages which are the Ligamenta Lata, Ligament. rotundum, Ovaria, Fallopian Tubes, Vagina & Spermatic Vessels &c.

The Mons Veneris is that Rising situated on the upper & fore-part of ye. Os Pubis & covered with Hair wch. is supposed to hastly ornamental ~~but~~ chiefly serves to defend the Parts from Injuries from Friction &c. — this Prominence or Rising is caused by a large Qnty. of Adips under the common Integuments. From this is continued the Labia which reach to within about an Inch or thereabouts of ye. Anus gradually growing thinner from their Origin till they meet; from their Termination to the Anus is called Perinæum which is very short & without any Raphe — When a Woman is erect, the Labia at their Superior Part are a little separated by the Glans Clitoridis, but lie in contact from thence to their Termination; just as they do this, at the Beginning of

the

the Perinæum there is a transverse ligament running from one of ye. Labia to ye. other called the Frenum, wch. is allways torn in the first Labour and sometimes in the first Coit.

The Clitoris is situated in the Superior part of the Pudenda immediately under the os Pubis to which its Body is attached by a ligament, and from thence it hangs down with its Glans & prepuce between the Labia: the Prepuce like the Prepuce in males is only a doubling of the Cuticle & Cuticle serving to cover the Glans, and from it, on the seperating the Labia, there appears a continuation of this Doubling of ye. Integument to on each side called the Nymphæ - A little below the Clitoris there is a small Eminence immediately under which the Meatus Urinar. which leads into the Bladder - a little below this we have the Os Vaginæ at the Entrance of which is placed a fine Circular membrane which exists only in Virgins and is called Hymen; this is commonly torn in the first Coit & its lacerated parts form those little Eminences called Carunculæ Myrtiformes which are visible in most women at this Time -

The Contents of the female Pelvis are the Uterus, Urinary Bladder & Rectum, which are all situated one above the other & lie upon each other; the Bladder wch.

the

the Urethra is uppermost; under this, the Uterus & Vagina, & below them the Rectum: the Peritoneum is reflected upon some parts of all these & gives ~~covered~~ an entire covering to the Uterus; it is reflected over the Superior extremity & posterior Surface of ye. Bladder as in Men, from thence it passes onwards to the lower part of ye. anterior Surface of the Uterus and is reflected upwards & over its upper extremity and down the posterior Surface running a little way upon the posterior part of ye. Vagina from whence it is continued over the Anterior Surface of ye. Rectum as in Men — From hence it is obvious that in ye. Ascites Water may pass down between the Uterus & Rectum & form a Tumour in Perinæo, or it may be felt by introducing a Finger up the Vagina; and a Descent of ye. Intestines may happen here as in Men between the Rectum & Bladder & causing an Hernia: but these cases are very rare: if ye. Water in an Ascites should work its way down into the Pelvis & by down in Perinæo it may be discharged by a Puncture with a Trocker in Perinæo —

The Urethra, Vagina & Rectum are all hollow Tubes obeying the Course & direction of the Sacrum; the Urethra makes a small curvature downwards & upwards & hence the Female Catheter is made a little incurvated at its ~~extremity~~; the Vagina makes a larger

curvature

Curvature than the Urethra, & hence in introducing the Finger up it we are to pass it backwards a little towards the Sacrum & then bring it forwards & upwards. The Rectum makes a larger Curvature than either or The Course of the Urethra we ought to attend to in passing the Catheter, which is done in this manner. The Woman is laid on her Back & covered by the Bed-cloaths, you take the Catheter in one Hand and with the other you feel for the Pubis, carry a Finger downwards between the Labia, feel for the Clitoris and continue carry your Finger downwards till you find the little Emin.ce below which is the orifice of y.e Meat. Urinar., you then keep your Finger fixed just below it & press the Catheter upon the Finger with the Concave part to the Pubis & gently moving it about it will soon slip into the Urethra & will easily pass into the Bladder—

N3. It is the Practice in Midwifery for the Woman to lie on the left side; and I have been told by some Practitioners in Midwifery, that the best & most certain way of hitting the Meat. Urinar. under Cover is to keep the Fore-finger of y.e left Hand just in the mouth of the Vagina & press gently with it upwards against the Pubis, the Catheter is then to be passed along this Finger

into

the Vagina a little way, it is then to be slowly & cautiously drawn out of the Vagina & the Point moved a little upwards and by gently pushing & moving it about it will easily & readily pass into the Urethra —

The Uterus is placed loose in the Pelvis & its situation is rather oblique inclining a little to the right side. Its figure is somewhat or rather resembling a flattend Pear triangular, and it is divided into its Fundus, Surfaces, Sides & Neck — From each side goes off what is called the Ligam.t Latum, which is only a continuation & doubling of y.e Peritoneum; and from the upper part of its Body are sent off the Ligam.t Rotund. which may be traced upwards thro the Abdominal Rings thro which they pass & are spent upon the Labia: The Ovaria or female Testicles are two oval Bodies one on each side of y.e Uterus at some distance from it between the doubling of the Ligam.t Lata; to these the Spermatic Vessels which are two arteries & two Veins are sent and which take their Origin in the same manner as in the Male — From the Horns or two superior angles of y.e Uterus the Fallopian Tubes are sent off which run some distance between the two Laminæ of y.e Ligam.t Lata & terminate in several Jagged Threads called Morsus Diaboli —

The Mons Veneris is a Rising formed by a larger Quantity of adipose membrane and is covered with Hair as before mentioned —

The Labia are only a continuation & doubling of the Cuticle & Cutis with Cellular membrane between which is Reticular, & hence they are so liable to be distended wth. Water in dropsical Habits; there are a No. of Follicles situated within the Labia which contain a mucus to lubricate the Parts —

The Labia interna or Nymphæ are continuations of the common Integum^ts. and likewise have a No. of Follicles containing Mucus — They are liable to be come elongated sometimes projecting without the external Labia which they are very troublesome & require to be taken off, which may be done with a pr. of Scissors or a Knife; this most commonly happens to women who use much Exercise. In Virgins they are generally firm, but in Women who have used much Coition they are Lax & all ways swell in the time of Coit to grasp the Penis more closely — In Africa & other hot Countries it is said that they are in common very large, insomuch that it gave a humorous Medical Gent^n. occasion to say, when asked about it (he had been in africa) that they were so long as to be drawn on like a pair of Boots. Their

Their use is said to direct the stream of ye. Urine &c.

The Hymen is differently situated in diffs. women i.e. in some, it is nearer, in others farther from the exterior mouth of ye. Vagina, but in common it is placed at the mouth of it – It is doubted by some whether it does exist but I believe it allways does in every Female before they arrive at the age of Puberty, but when the menses come on they generally destroy it & it then forms the Carunculæ myrtiformes – It is generally of a semilunar Figure but sometimes it is entirely circular with a Hole in the middle of it, and in such the menses do not break down or destroy it – It sometimes happens in children that this membrane mounts upwd. & obstructs the Passage of ye. Urine by being spread over the Orifice of ye. meat. urinar. in which Case, the urine will generally point at the orifice & a Punct. must be made with the point of Lancet into it; but it more frequently happens that it is imperforate & by this means stops up entirely the Passage of the menses and it is seldom discovered till there is quantity of menstrual Discharge lodged behind it and forming a Tumour which at last will obstruct & cause a suppression of Urine; a Case of this sort happened to Mr

Warner

Warner, in which the Girl would not discover what was the matter with her, but had her Water drawn off by the Catheter from time to time & took many medicines for a Suppression of urine till the Tumour formed by the Lodging of y^e^. menstrual Flux showd itself, when the Cause of her Compt. was immediately known & removed by Opening the imperforated Hymen & the Girl afterwards did well in a Short time —

It sometimes happens that when it is circular & has a Perforation in the middle of it, it is so strong as not to be broke down by the Penis & many of y^e^. Women of y^e^. Town have been first led to submit themselves to the Embraces of Men, when they have had this, wth. a presumption that they are in no danger of being got with Child on acct. of this memb^r^. obstructing the Penis — In these Cases a Surgeon is sometimes called in to Divide it, which is best done by making a Crucial Incision thro it with a Lancet — Dr. Mackenzie has been obliged several times to divide this membrane before he could deliver Women —

Mr. Else has two preparations of the Hymen of two Women in which it is almost perfect; and one of the Women was to all appearance 60 years of age & the other was that of Mary Edmonds who was hang^d^ for Murder.

Seeing

Seeing that the Hymen is most commonly destroyed by the flowing of ye. Menses before marriage, the notion of those women who have it not, ~~having~~ lost their Virginity will appear groundless; however its Existence is a presumptive proof of Virginity, notwithstanding that many of the women of ye. Town have it ~~not~~

Carunculæ Myrtiformes are the remains of this membrane, and may be seen at the Entrance of ye. Vagina in those Women who have not had many Children, but in those who have bore a great many and likewise in those who use much Coition they are worn away and cannot be seen —

The Clitoris is very similar to the Penis in Men in all its Parts except the want of a Corpus Spongios. & Urethra; it is like the Penis ligamentous & Cellular its Cells are distended with Blood causing Erection in Coition; it has a Glans & Prepuce like the Penis. Its Body is formed by Crura arising from the Ischium & running obliquely upwards till they get under the Pubis & then they unite into one & is attached to the Pubis by a ligam^t. — Its muscles & Vessels are similar to those of ye. Penis — It is looked upon to be the Seat of Pleasure in Coition in Women & is so situated

that

that the Glans undergoes Friction in Coition, which means the Venereal orgasm is sooner brought about — It is sometimes enlarged by disease; and in some Young Women it is so large as to project beyond the external Labia, in wh. case it is subject to Friction in Walking which causes a Furor Uterinus — Surgeons are sometimes called to amputate the Superfluous Part, which is an easy Operation, & the Hemorrhage is soon stopped by Styptics.

The Plexus Retiformis is situated near the Crus Clitoridis and appears of a red Colour seeming to be a Series of Veins ~~as~~ they have a Communication with the Vena Cava, and there is likewise a free communication from them to the Crura Clitoridis, for by blowing air into the Crus, you distend the Plexus first & from thence the air will pass into the Cava.

The Vagina is a membranous & muscular canal serving for the admission of the Penis in Coitu, the Passage of the Catamenia & Fœtus &c; internally it is lined with a fine membrane, said by some to be a continuation of the Cuticle, but it is very different from the Cuticle: on its internal Surface there rises a small Longitudinal Eminence from each Side & which are observed a No. of Rugæ running Circularly which

are

are very plain in young women; but in those who have had many children they are generally obliterated. There are likewise a no. of Follicles on its internal surface in which a mucus is deposited to lubricate the Parts; these are described as Glands by some, but they are only Follicles to contain the mucus which is deposited there by Vessels — Its posterior extremity is connected to the Uterus, surrounding its Cervix, and has the os Tinca projecting into it —

At the Posterior part between the Vagina & rectum are several small glands called Cowpers Glands whose Ducts are said to terminate on each side of ye. Vagina on its internal Surface; in some these Ducts are very plain, in others not to be seen —

The Vagina has no Muscles but those Fibres surrounding it at its mouth & called Sphincter Vaginæ.

The Urethra is very short in women, hence the Reason why they so seldom require the operation for the Stone. It is surrounded thro its whole length by a tough hard Substance called the female Prostate which we are obliged to cut thro in cutting for the Stone, and hence it will appear that the old method of forcing open the Passage by a Blunt Gorget was very cruel & much more dangerous than the Present method, as the Inflammation in the

foot

first would be much greater on acct. of the Violence done to the Parts by forcing in the Forceps & by that means lacerating instead of cutting them as in the present method which is by introducing a Straight Director into the Bladder and holding it level, wth. the Groove upwards a Cutting Gorget is carried along the Groove strait into the Bladder, by which means the Prostate is divided laterally & ~~the Fauces of~~ the Clitoris is safe from being wounded: If a Knife is used instead of yd. Gorget, the Groove of the Director is to be turned obliquely outwards to the right side that the Knife in passing along in it may divide the prostate laterally; a Gorget is then to be introduced into the Bladder, the Director withdrawn and the Forceps introduced &c.

The Uterus is the principal Organ of Generation; it is supposed to resemble a Pear in Figure, which is a little flattend, but this is altered in old Women who have had many Children — It is divided into its Surfaces, Edges, Extremities, Body, Horns or Angles, Cervix & Fundus.

The

The inferior Surface rests upon the Rectum, the superior is turned towards the Bladder; Its Edges are two, one turned to each side of ye. Pelvis; its Extremities are great & small, the great Extremity or Fundus is superior, its small turned downwards & forms its Cervix, in which is situated the os Tinia as it is called; the middle is its Body; and a little below its Fundus we have its Horns or Angles from which go off the Fallopian Tubes — It is always larger in women who have had Children than in those who were never pregnant, and is capable of being enormously enlarged in Pregnancy. Its Cavity answers to the Virgina of it externally —

The Structure of it is variously described by diff.t authors, it is commonly said to have 3 Coats, the membranous, muscular, and Cuticular; the 1st. is only a continuation of ye. Peritoneum, & the others cannot be seperated without Violence; the inner Coat is a Continuation of ye. internal membrane of ye. Vagina — Its Subst.ce in Virgins is firm & Compact, but in Pregnancy becomes more open & spongy & hence appears as thick if not thicker as it increases in size in Pregnancy

advances

advances; it is thickest at its Cervix and thin=
=nest at its Angles; and is of different Colours in diff.
Parts, in some Places whitish, & others red — Some
think it is muscular from its having a Power of
Contraction; but I must own I never could discover
any muscular Fibres in it, and the Part which is
said to be muscular has not that red fasciculated
appearance which Muscles have, and we may ac=
=count for the Contraction of y. Uterus in the same
manner as the arteries contract & Dilate, by their
Elasticity — There are the same appearance of
Rugæ & a longitudinal Eminence at its Cervix as
there is in the Vagina but these disappear in Wom-
who have had many Children; and there are Fol=
=licles on its internal Surface which contain a Mu=
=cus to lubricate it; this mucus we are told is some
times secreted in such large Quantities as to stop
up the mouth of y. Uterus & cause Barrenness —
The Vessels of the Uterus are very Numerous —

The Fallopian Tubes are so called because he first
discovered that they were hollow; they go off one from
each Angle or Horn of y. Uterus and are about 5 or
6.

6 Fingers breadth in length and running between the Lamina of ye. Ligamenta Lata terminate near the Ovaria in the morbus Diabolo: the Canals when they first goes off from the Uterus are very small, hardly admitting a hog's Bristle, but they increase to the Size of a Goose-Quill in their Passage; when blown up with air they appear convoluted with Strictures in different Parts where they are supposed to have Valves. By Disease, as in the ascites they become much elongated; and sometimes their Canals are closed up at the Extremities, which according to our present Notions of Generation causes Barrenness —

The Structure of these Canals are said by some to be muscular, Membranous, Glandular, & Cellular: I never saw anything like muscular Fibres in them, or Glands; its membranous Coat is nothing but the Covering given them by the Ligamenta Lata; the internal Coat is a continuation of the internal Coat of ye. Uterus & in some Places projects & forms Folds similar to the Valvulæ conniventes

Conniventes of the Intestines — They are Vascular; and their use is said to be to convey the Semen thrown into the Uterus in Coitu to the ovaries to be impregnated & from thence to reconvey it back again to the Uterus where it lies till the Birth —

The Ovaria are connected to the Uterus by the Ligamenta Lata, between the 2 Laminæ of w.h. they are situated, about two Fingers breadth from the Uterus, in the unimpregnated State lying near the Cervix Uteri: they are of different Sizes in different Women; in healthy young Wom: they are generally as large as a Pidgeons Egg, but in old Women they are commonly worn away much smaller — Externally they are smooth & even and are of an oval Form with their sides a little flattened; their structure internally is different from that of w.d. Testes, they appear white & Cellular with a no. of little Bags or Follicles called Ova which are lodged in the Cellular substance of them, which contain a kind of Gelatinous Fluid which appears to be of a Lymphatic nature, as it hardens by boiling: sometimes we meet with other membra

nous

= nous Bags in the Ovaries called Hydatids which are distend with Water in Dropsies of ye. Ovaries, in which Disease they are very large sometimes —
Their external Covering is only a Peritoneal one being situated between the doubling of Peritoneum continued from the Uterus under the name of Ligam^t. Lata; the other Tunic is a proper one.
Formerly they were supposed to be similar to the Testes in Men & that they secreted Semen, but I do not believe they are Secretory Organs —

The Ligamenta lata have been described as only continuations of ye. Peritoneum —
The Ligamenta Rotundae are membranous; they are very apparent in pregnant Women and appear at that Time of a red Colour, but in young Female unimpregnated Women they are perfectly white; & in old Women they are of a blue Colour. They go off from the Uterus thro the abdominal Rings & are lost in the Labia, on which account they are supposed to assist in Generation, for being affected by the Friction in Coitu they convey a Sense of Pleasure to the Uterus.

The Uterus has 4 Arteries sent to it, 2 Spermatic & 2 Pudendal, which last come from the internal Iliacs and are spent upon the Uterus in a Serpentine Course and are distributed on the internal Surface in a very Singular manner — From these Vessels the Menstrua flow —

The Veins are similar in their course to the arteries; they appear to have no Valves —

With Respect to Conception, little can be said about the manner of its Performance, worthy of Notice; the present rec.d Opinion of this Operation of Nature seems to be the most plausible of all the Hypotheses yet started, tho' it is not without its Objections; and it is this — The Male Semen is thrown into the Uterus by the Penis in the Coit, at which Time the fallopian Tubes are supposed to be dilated to receive it and convey it to the Ovaries where it is impregnated by one of the Ova; it is supposed that at this Time y.e Ovaries are closely embraced by the Fimbriæ of y.e fallopian Tubes or morsus Diabolicus it is called and that an Adhesion takes Place, ~~till~~ one of y.e membra-

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= nous Bags containing the Ovum bursts & impregnates it, after which it is again returned by the fallopian Tubes & deposited in the Uterus — Fœtus's have been found lodged in the fallopian Tubes, which seems to confirm the Opinion that the Impregnation takes Place in the Ovaries & afterwards is conveyed to the Uterus —

Lecture on Preparations and Injections &c —

Ruysch was the first who brought this art to any degree of Perfection, tho Injections were used before his Time by Malpighi & others — The use of Injections was rec.d with great opposition at first, the Opponents alledging that the Parts thus Injected & prepared put on a very different aspect in them to what they were in their natural State in the living Subject: this in some measure is true but yet their use & assistance to Students in anatomy are very great & evident —

'Tis within this few years this art was kept a Secret by Anatomists, but now to the Honour of y.e Profession is made public —

It cannot be taught by words, but must be learned by Practice & unwearied application; for we must expect to fail several Times before we succeed in making a good preparation, as it depends upon many nice circumstances; the Syringe should neither be too hot nor too cold, should

be

be well cleaned & well valved; the Injection should be of a proper degree of Heat, of a proper consist.ce; the Pipe well secured at the mouth of the Vessel & kept in a proper Direction; the Injection should not be thrown in with too much Force least the Vessel should burst &c. The Subject should be first macerated and all the Blood squeezed out of the Vessels; it is to be put into ~~cold~~ Warm Water & suffered to remain in it long enough for it to acquire a warmth equal to the natural Heat —

Preparations are of two kinds, the hard & the soft; the hard are commonly kept dry & the soft wet, but there are some exceptions to this Rule — In making hard prep.s we rob the Part of all the Cellular Memb.d, the Oil, and the Blood, and all superfluous Parts. Wet prep.s are commonly preserved in Spirits, the dry'd ones covered over with Varnish —

Injections are of two Sorts, the fine, and the Coarse; the fine is for injecting the minute Vessels, the Coarse for distending the large

Branches

Branches after the fine small ones are filled — Injections are of various colours, as red, blue, green, yellow, white, and black: The fine red which is used to inject the minute Vessels is, equal parts of Turbinth.te & brown Spt. Varnish, with a sufficient qty. of Vermilion finely Levigated — the Tallow Injection is often used, especially for injecting Fœtuses — The Injection should be of a proper lowe volume, and to try it, it may be thrown into Cold Water: if it is too thick a little Turpentine Varnish may be added, if too thin it may be kept on the Fire till some of yd. Varnish is evaporated: it should be of such a degree of Heat as for us to bear our Finger in it — Many Diff.t Injections are made use of, each of which has its use; for wet preparations, Inet of Turpent. Varnish, fresh Butter & Vermillion are very good, to inject any part very minutely, as for Instance the Villous Coat of ye. Intestines &c. Solutions of Glue likewise may be used, but it is not a good Injection —

Gum. Arabic, and Isinglass dissolved make good Injections for fine ppa. that are to be dried & kept in

in Spirits, as of ye. Cutis, Tendons, Bones, Ligam. &c. which are best preserved in Sp. Turbenth. after being well dried; Injections of ye. Cutis should be kept stretched upon a Board till quite dry —

The Wet Preparations, i.e. such as are not to be dried, are best kept in malt Spts. which are to be changed as often as they grow foul; they'll be clearer & keep so longer, if to a Pint of Spts. is added ℥j Spt. Salis — The Mouths of ye. Glasses are to be well stopped, with a Bladder &c —

The apparatus for Injecting, i.e. the Vessels, for common Injections are a Syringe with a No. of Pipes of Different Sizes and a Stop Cock: The Syringes are generally of Brass & are of Different Sizes according to the Size of ye. Part to be prepared; and there should be a Different One for each Different coloured Injection — The Stop Cock is of use when a great qty. of Injection is required, as in the Heart of an Adult —

Supposing we are to inject a Subject. It is to be macerated in Cold Water 2 or 3 days in order to

to drain out as much Blood as possible; having done this, it is to be put into warm water till it has acquired a degree of Heat equal to the Natural in order to favour the Running of yd. Injection; before it is put into Warm Water the Pipes may be fixed to the Vessels, which should be as near the Size of yd. Vessel it is to be fixed to as possible, & well secured with a Ligature — In preparing young Subjects for the arteries we don't macerate the whole Body but the upper & lower Extremities only are put into Warm Water for an hour & half or 2 Hours previous to the Injecting it, which is all the maceration necessary or that can be given it, During this maceration the Syringe & Injection is to be got in Readiness; and the Subject being laid in a Straight Direction, the fine Injection is to be thrown in till we meet with a Resistance, we are then to desist & withdraw the Syringe, suffering a little of yd. Injection to run out of the Vessels; the Course Injection is then to be injected —

after the Subject has lain long enough for the Injection to get cold, we then proceed to Dissection, in doing which all the adeps, Cellular membrane and superfluous parts of y^d. muscles are to be removed but as ~~much~~ many of the muscles should be left as can conveniently –

after Dissection they are to be preserved either wet or Dry – If we wish to keep them in Sp^t., wet, Sp^t. of Turbinth. is best, in which they are to be suspended in a Glass by Threads & the Glass well stopped with a Bladder; in 2 or 3 months the Sp^t. will grow foul & must be changed; when if we intend to keep the Sp^n. for a length of Time, ~~the Glass~~ must be stopped by first tying a Bladder over it after having gummed the mouth on the outside with a Solut^n. of Gum. Arab. and ~~upon~~ the first Bladder a plate of lead is to be put, cut as near the size of y^d. mouth of y^d. Glass as possible, over which a second Bladder is to be tied by which means the Sp^t. will be prevented from Evaporating –

If we are to Dry the Subject, supposing it to be for the Blood Vessels, after Dissection it is to be put into

into the best posture for shewing the Blood Vessels & kept so till Dry; it is to be placed in an Open airy Place & every day the oily Matter which exudes must be carefully scraped off and sprinkled with Sp.ts Turb. till quite Dry, after which it may be varnished with the Shining Varnish, and be exposed to q.d air very freqtly to destroy Vermin —

If we want to keep the Parts dry without Injecting, as the Penis, cellular membrane of q.d Intestines &c. we are to blow air into them from time to time till they become Dry —

To preserve the Valves of q.d Heart, it may be injected with Tallow & after it has become perfectly Dry the Tallow may be melted out by placing the Heart before a Fire — The method of Injecting a Heart, as is commonly done, is to fix a Pipe into both auricles & inject first w.th red to fill the Ventricles & afterwards fill the auricles with yellow, and the Coronaries may be filled with Quicksilver —

The Testicles may easily be injected by the Vasa deferentia with Quicksilver.

The Penis, by q.d Cruro a Penis to fill the Corpora Cavernos.

Cavernosa, and to distend the Glans, either by the Veins or the Corpus Spongiosum — They may be kept either wet or dry —

The Placenta may be injected & looks very well, when it succeeds & the Arteries are filled with red & the Veins with yellow or white &c.: the Valves of yd. Veins must be previously broke down with a Probe.

The best method of injecting a Foetus is by the Umbilical Artery: a Child may be injected by the faulty Iliac, or brachial arteries, but best by the Aorta Superior; and when the Injection appears thro the Cornea in the Iris it is a proof it has run well & we must desist from forcing any more into them, for fear of rupturing some of yd. Vessels —

The Corroded Preparations, such as of yd. Liver, Lungs, or Kidneys are very beautiful when the arteries & veins are injected with different Colours; the Injection used for this Purpose should be softer than common, because the Spt. Sales will harden it & render it too brittle — The method of making them is by throwing the Parts into Spt. Salis after the Injection has cooled and they are to

to remain in it till all the Parts are corroded & destroyed by ye. Ppts., leaving only the Injection. Thus in the Lungs the air Tubes, Arteries, and Veins may be shewn in green, red, and yellow colours, or according to Fancy: in the Kidneys, the Emulgt. Arteries & Veins with the Secretory Ducts: and in the Liver, the Vena portar. & Hepatic artery &c —

The following Injections & Varnishes are most in use —

Dr. Nicholls —

Coarse Injection.

℞. Rezin. flav. ℔ij.
Cera flav. ℔j
Terebinth. Varnish q.s. ℳ.

Fine Injection —

℞. Terebinth. Varnish q.v.
Vermilion q.s. ℳ.

Dr. Monroes.

Coarse —

℞. Cera flav. ℥ij
Sevi ov. ℥iij.
Vermilion q.v. ℳ.

Fine

℞. ol. Terebinth q.v.
Vermilion q.s. ad Color.

Dr. Hunter's

Coarse

℞. Sevi ov. depurat. ℥iij.
Rezin. flav. ℥viij
Cera flav. ℥iiij. ℳ.

Fine

℞. Terb. Varnish ℥iv
ol. Bude. ℥ss.
Vermilion q.s. ℳ.

Colours for Injection

Vermilion, Orange Ore, King's Yellow, Ivory Black, Prussian Blue — White Wax.

335 - Varnishes

Shining Varnish

℞. Rezin. flav.
Colophon. aa. ℔ij
Sp. Vini Rect. Long. ij ℔.

Hard white Spt. Varnish.

℞. Gum. Juniper. ℥viiss
Sp. Vini Rect. Long. ij. M. f. Solutio. S. a.

Turpentine Varnish.

℞. Ol. Terebinth. ℔j.
Rezin. Flav. ℥x in ℔.

Brown hard Sp. Varnish

℞. Gum. Juniper. ℥iiss.
Shele. Lac. ℥viij
Sp. Vini rect. Long. ij ℔

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